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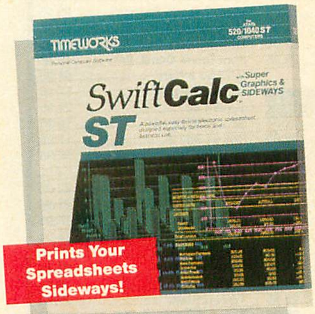
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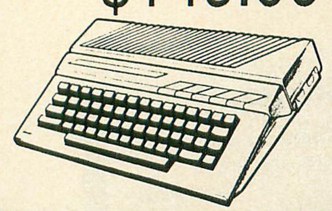
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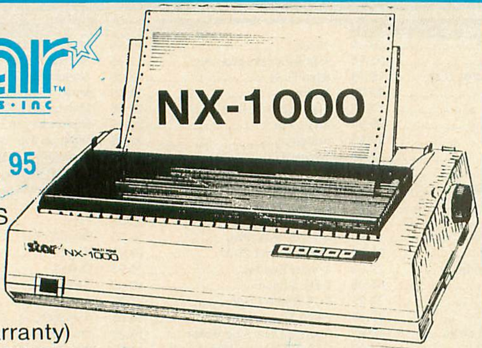
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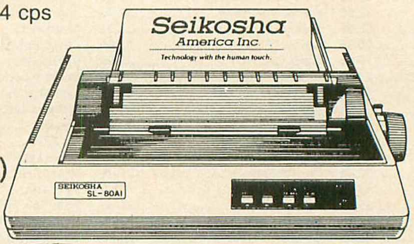
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The ATARI Resource

APRIL 1988, VOLUME 6, NUMBER 12

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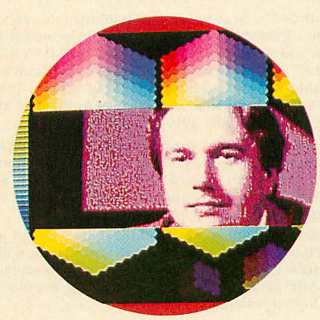
DEPARTMENTS



The team that created and marketed Virtuoso desktop video software for Atari XL/XE. Desktop Video for Atari XL/XE. Page 36

SOFTWARE LIBRARY

ST RESOURCE



Cyber ST Desktop Video. Page 41

Antic

The **ATARI** Resource

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By the way, this new availability of commercial Antic Software products online *doesn't* affect the ANTIC ONLINE Software Shelf which continues presenting eight recent **Antic** and START programs (8-bit and ST) each month—FREE for just the downloading time charges. In fact, *no* ongoing ANTIC ONLINE features have been cut back because of adding these new services.

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James Capparell
Publisher, Antic

SX212 SOFTWARE

I recently purchased the new Atari SX212 modem and I haven't been able to get any of my telecommunications software to work with it. The modem comes with both a standard RS-232 port and an Atari serial I/O port, so I thought I would be able to run the modem directly through the serial port, with no need for an interface such as the Atari 850. No handler software came with the modem as I had read was originally planned.

Is there any handler software available so that I can run terminal software that normally runs through the 850 interface for 1200 baud, such as the Chameleon VT-52 or ADM-3A emulators? Until now, I've used an Atari 1030 modem, but I bought the SX212 specifically for the faster 1200 baud and I don't want to buy an interface if I don't need to.

Judy Shadduck
Lock Haven, PA

No, you won't need an 850-type interface to use the SX212. As for SX212 software, the author of the popular Express! public domain modem software series, Keith Ledbetter, was assigned to write SX Express! It should be available as an inexpensive add-on package by the time you read this. Meanwhile, a public domain handler that reportedly works with 850 Express! and AMODEM is being widely circulated by users groups and online (the Atari forums on CompuServe and GEnie, etc.).

Atari didn't want to hold the long-awaited SX212 off the market while this situation was being resolved. And in fact the entire first shipment of these $99.95 modems quickly sold out. Longtime **Antic** *author Matthew Ratcliff will be reviewing the SX212 in a forthcoming issue.*—ANTIC ED

MISSING INFO

My article on News Station Companion (**Antic**, December 1987) left out some pertinent information on conversion of text files created with AtariWriter and PaperClip.

With AtariWriter files, first use global formatting to set margins, changing the number of lines to 160. Set the left margin at 1 and the right at 80, or for double-column printing use 1 and 41 for the left margins and 39 and 79 for the right.

Do *not* use the ASCII save routine. Use the *print command*, entering N to the printer prompt, and then select the Atari 1027 printer driver. Save the file to disk with a .TXT extender.

Always convert to one column, letting AtariWriter or PaperClip format the double-column printing. The program routine just leaves gaps in the copy and should be used only for special purposes.

PaperClip also can be used in a similar manner if you use the print routine and save the file to disk *without* control codes. Type [CONTROL] [SHIFT] [O] *(not zero)* and then type a filename at the Print Device? prompt.

Steve Fishbein
Newport News, VA

MORE NEWS STATION

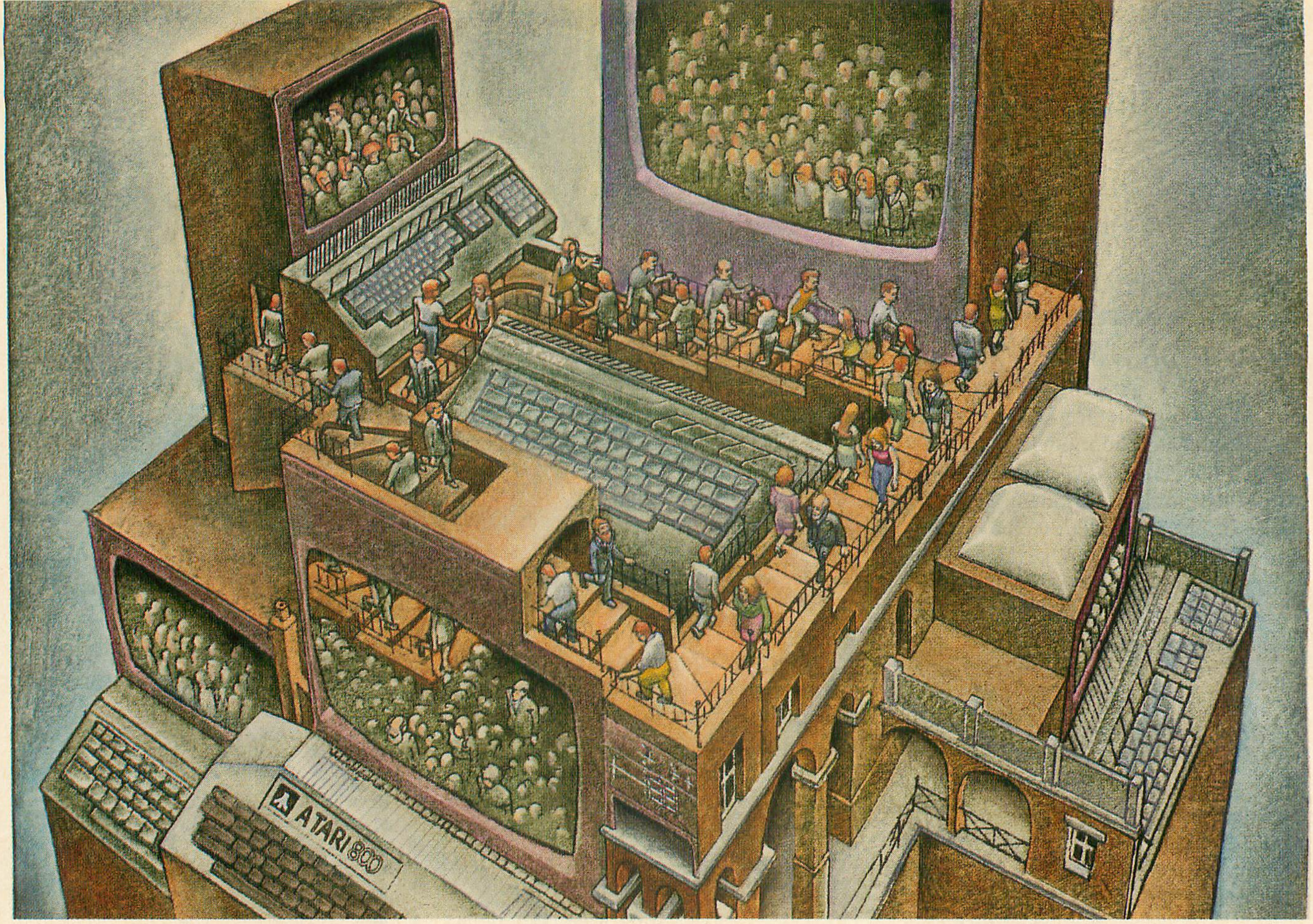
News Station and News Station Companion continue to amaze me with their versatility. In addition to being able to publish great newsletters, I also use them to make personal and business cards. This is done on one plate, then repeated on the other seven plates.

The Companion's plate manipulator feature lets me make passable posters with several Print Shop icons. This is done by laying out one plate as the top half of the poster, manipulating it and saving the four manipulated plates that result. These are automatically saved as plates 1 through 4. Then I lay out another plate as the lower half of the poster, manipulate it and save the resulting manipulated plates on another disk. Finally, I add these plates to the first disk, renaming them as plates 5 through 8. Presto: a Print Shop-sized poster.

When your review called News Station and News Station Companion "two products that combine into a mighty rival for Newsroom," you were right on the mark.

Frank Carey
Troy, MI

continued on page 10


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continued from page 7

BOUNCE BACK

In my program Bounce (*Rassilon's Triple-Header*, **Antic**, January 1988) there is a logic error in the short routine that allows faster movement of the "paddle" when the fire button is pressed. Line 110 should be renumbered as line 125 (make sure that line 110 is deleted afterward). This will allow double movement of the "paddle" for left direction as well as right direction.

Robert "Rassilon" Patton
CompuServe ID 70057,674

TIME CHANGE

I typed in *Weather Calculator* (**Antic**, September 1986) and it ran the first time. In the sunrise/sunset option, however, it gave me sunrise and sunset times for the Northern Hemisphere, so I have included the changes for Southern Hemisphere users:

```
6031 M=M-16:IF M<0
THEN M=M+12
6515 M=M+16:IF M>12
THEN M=M-12
```

David Zanetti
Wellington,
New Zealand

MINDSCAPE PRAISE

I discovered a bug in the gameplay of Defender of the Crown, and I called Mindscape's toll-free number and spoke to a gentleman who said he'd look into the problem.

Two days later he called me back, saying that the programmers were working on the problem and it would be about a month before the new version was ready. He also said he'd let me know when to send in my disks for repair.

Recently he called me again, saying that if I gave them another week and then sent the disks, Mindscape would replace them.

I'm very impressed with Mindscape's customer service and the number of new titles they're bringing out for the Atari 8-bit computer. Mindscape should be commended—it's nice to know there is still a company that stands behind Atari owners.

Matt Stone
Framingham, MA

***Antic** welcomes your feedback, but we regret that the large volume of mail makes it impossible for the Editors to reply to everyone. Although we do respond to as much reader correspondence as time permits, our highest priority must be to publish I/O answers to questions that are meaningful to a substantial number of readers.*

Send letters to: Antic I/O Board, 544 Second Street, San Francisco, CA 94107.

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GAUNTLET

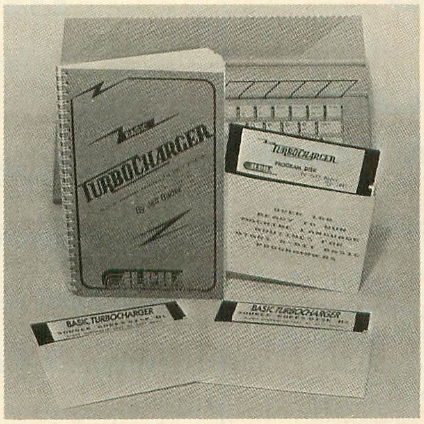
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—ANTIC ED

By MATTHEW RATCLIFF

Trigger Throttle

Easy joystick control online

Trigger Throttle is a short machine language routine designed for modem users who go online with Keith Ledbetter's popular Express! software (version 3.0 or newer). It might work with other modem programs too, either as is or with changes. So let Antic know if you find additional Throttle-compatible software. This BASIC program works on 8-bit Atari computers with at least 48K and a disk drive.

When you're online with one of the big telecommunications services, such as CompuServe or GEnie, you find far more information than you can easily read. Important data often scrolls off the screen before you can read it all.

Most experienced online users know that pressing [CONTROL] [S] will pause the information being sent through the modem. When you're ready to move on, [CONTROL] [Q] will start things again. But it takes a bit of hand-eye coordination to accomplish this. As soon as you see that something important is going to scroll off the screen, you must put your left hand on the keyboard, press the [CONTROL] key and then tap the [S] key. At 300 baud this is generally no problem. But at 1200 baud and especially 2400 baud you probably find that lots of information gets lost or costs you extra money to reread.

I like to sit back and relax while online, especially if I've got a lot of messages to read. On Delphi, for example, I will type the FORUM command READ NEW NS to read new messages nonstop.

If you have played plenty of action games on your Atari, I'm sure your joystick button reaction time is much quicker than your keyboard responses. With Trigger Throttle, I simply press the joystick button to pause the display. Trigger Throttle automatically sends the [CONTROL] [S] character to stop the scrolling. Pressing the button again sends the [CONTROL] [Q] character to resume the scroll.

Type in Listing 1, THROTTLE.BAS, check it with TYPO II and SAVE a copy before you RUN it. When RUN, it will

continued on page 14

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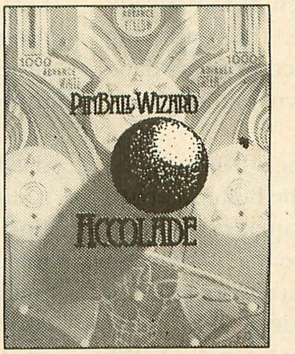
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By MATTHEW RATCLIFF

First Time Online

Getting started in Atari telecomputing

Telecomputing is more than just another way to use your computer. With the help of inexpensive modem hardware connected to the RS-232 serial interface of your Atari, your telephone line becomes a gateway to hundreds of other Atari users who share your interests.

The most common and affordable use for a modem is accessing local bulletin board systems (BBS). These are simply modem-equipped computers running special communications software which automatically answers the phone, thus allowing callers to access the computer's databases with their own modems and computers.

In principle, the local BBS is not all that different from the bulletin board down at the laundromat except that it can be much more interactive. Accessing a BBS can be a real social event where you share ideas with other modem users on many topics. A BBS is a place where you could make fast, lifelong friends. If you ever actively used a CB Radio, then you already have a good feel for what it's like to communicate with others on a BBS.

Over 5 years ago I called my first sysop (system operator who owns and maintains the BBS host computer). He has become a very good friend and we both are now officers in the same Atari users group (computer club). Sysops dedicate their computer, modem and phone line to a BBS just for the love of it. Setting up and running a BBS can be an expensive and time-consuming process—addictive too.

A BBS is usually made up of several database "forums," each one covering a different topic. Typically you will find a main database on more general interests and at least one on programming. Other common forums include movie reviews, commentaries on sports, coverage of local computer club events and computer gaming tips.

Talking with a BBS over your modem is like running a program on your own computer, with menus to guide you along. At the main menu you might choose the general interest forum. There you could read messages and reply to them as well. Entering and editing a message takes a bit of practice, but the BBS software usually provides enough help to get the job done.

However, a BBS has more to offer than just an arena for debate. Generally the BBS will provide a database of public domain programs that you can "download," using your software's communications protocol for transfering program files over the phone. Sysops may require that you contribute to the forums or upload public domain files occasionally to achieve a higher "clearance" allowing you more freedom on the BBS. ■

TRIGGER THROTTLE
continued from page 12

create a machine language file called THROTTLE.EXE. Antic Disk Subscribers will find THROTTLE.EXE on the monthly disk, along with the MAC/65 source code, THROTTLE.M65.

USING THROTTLE

From the Atari DOS 2.0 or 2.5 menu, use the [L] option to load THROTTLE.EXE. Trigger Throttle will display some prompts, reminding you how it works. Press [RETURN] to redisplay the DOS menu, then use the [L] option to load the Express! program.

Plug a joystick into port 1 of your 8-bit Atari and start using the trigger button to take control of the bulletin board systems that talk too fast for you. To disable Trigger Throttle, simply press the [RESET] key.

HOW IT WORKS

Trigger Throttle is a VBI (vertical blank interrupt) routine. The code that handles the joystick reading and keyboard controls is only 62 bytes. It resides in the lower area of page 1, the system stack, generally recognized as a safe place for very small machine language programs. This leaves page 6 and the lower half of page 4 (the cassette buffer) free for other programs you may add later.

If done properly, many different VBI routines can run on the 8-bit Atari, each chained to the next. So far, Express! 3.0 is the only modem program I have found which follows the proper rules for putting in VBIs and lets me connect the Trigger Throttle program. ■

EXPRESS!
$10. 1030 version, PD0081; 850 version, PD0082. The Catalog, 544 Second Street, San Francisco, CA 94107. (800) 234-7001.

This issue kicks off a regular online communications feature by Matthew Ratcliff, a St. Louis aerospace engineer who won the 1986 Antic Award for Outstanding Contributor.

Listing on page 59

By EDWARD BROWN

Ballpark Figures

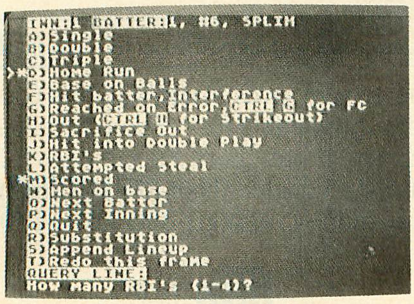
Batting out baseball statistics with Atari

Whether you're a little league coach, a softball league player or just an armchair manager, sooner or later you'll need to compile statistics for your team. Now Antic's Ballpark Figures takes the tedium out of this task. This BASIC program works on all 8-bit Atari computers. A disk drive is required.

Baseball is a game of statistics, so the saying goes. Certainly "America's national sport," with its lengthy playing season, seems to generate more numerical analysis than the other major categories of professional athletics.

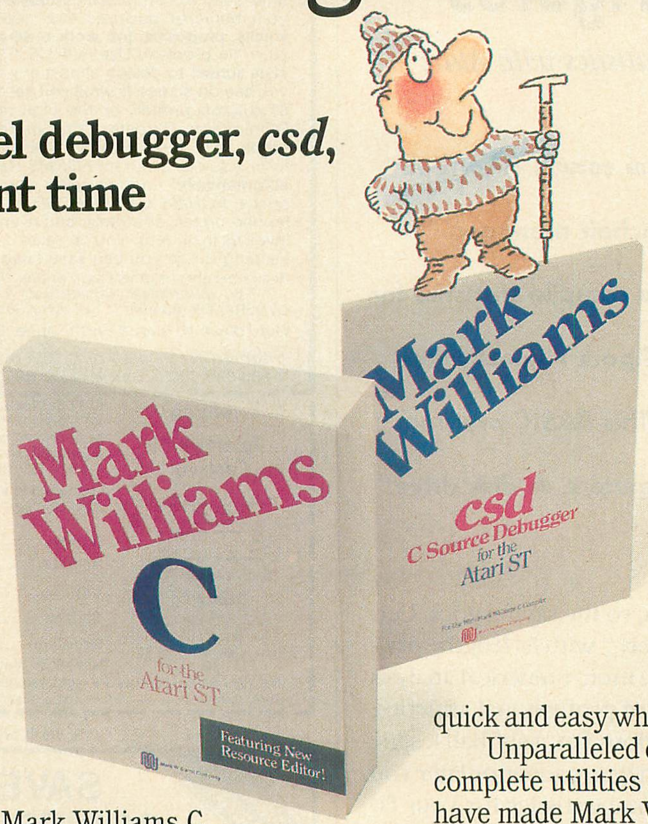
So no matter if you're just a serious fan, a softball league participant, or a little league manager, sooner or later you are going to want to compile some statistics for your favorite team. Done by hand in the traditional manner, it's tedious at best to pore over the team scorebook and churn out those seemingly endless statistical calculations throughout the season.

But when it comes to number-crunching, your trusty Atari can easily do all the dirty work. Now with Ballpark Figures software, you quickly enter information direct from your team's scorebook, selecting categories by simply choosing from a menu. The program automatically accumulates and calculates such statistics as batting average (BA), slugging percentage (SP) and on-base percentage (OBP) for up to 45 players on your team. The data can then be printed neatly on your Epson-compatible printer or saved to disk. *continued on page 19*



Mark Williams Raises C Programming To A New Level.

New source level debugger, *csd*, cuts development time in half!



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–Jonathan Sachs, *Micro/Systems Journal*

FEATURES

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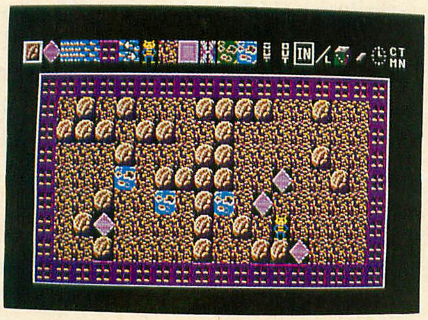
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April 8-Bit Games

Reviews: Infiltrator, Boulder Dash Construction Set



BOULDER DASH CONSTRUCTION KIT

Whether you are an Atari newcomer or a veteran gamer, **Boulder Dash Construction Kit** will provide hours of entertainment. Of course, one expects all the hallmarks of a proven arcade wristbuster. The simple objectives, fast action and superb graphics make for hours of addictive play.

Your goal is as direct as the greed on which it is based. Go mining for diamonds, racking up points for each gem. Avoid falling boulders and deadly fireflies as you navigate through a 15-screen sequence of the world's most dangerous caverns. Adding to the fun are magic walls, slime and other special items which combine to create caves where your survival will require thoughtful strategy as well as fast reflexes. The only sure thing is the number of diamonds you need to collect before you are released. Of course, you can always try to get more. Just don't become too greedy.

If this were the extent of the program, I would be comfortable recommending the package. Add a construction feature for designing and building custom mazes and you have a sure-fire winner. A simple design interface, similar to that used in a paint program, allows even the novice to quickly and easily create mazes to confound friends and relatives. And once you have created a few screens, they can be assembled in any order and stored sequentially for later play.

Boulder Dash Construction Kit is available in both 8-bit and ST versions, and both feature the same great graphics and fast, non-stop action. Both versions must be rebooted to switch between the game and the construction programs. But this latest incarnation of the classic Boulder Dash should satisfy all customers.—STEVE PANAK

(The ST version of this software was reviewed in the previous issue.)

$24.95. Epyx, P.O. Box 8020, 600 Galveston Drive, Redwood City, CA 94063. (415) 366-0606.

CIRCLE **281** ON READER SERVICE CARD



INFILTRATOR

Mindscape's **Infiltrator** is a combination of arcade air duel, flight simulator, maze game and graphic adventure. You—Johnny Mc Gibbitts, ace pilot, neurosurgeon and all-around good guy—are given three missions against the "Mad Leader." You can save the game after completing a mission and start from that point next time.

The starting display shows your hands resting casually on the controls of your helicopter, the DHX-1 Whizbang "Snuffmaster." Direction, altitude and weapons are controlled by the joystick. You must use the keyboard to get off the ground and perform other tasks. Read your course from a 3-D map that shows your position and altitude.

As you fly towards the enemy base you will encounter other helicopters. Some are loyal to the Mad Leader and some are friendly. It is always best to try to fool the enemy into letting you pass. Do this by requesting their identification. They will respond and ask for yours. If you give the right password, you can move on unmolested. Of course, a few of them will attack you no matter what you do.

I find the dogfights in Infiltrator more of a challenge than in pure aerial combat games. A lot is going on at one time. Warning bells go off as missiles home in on you. You must shoot off chaff and flares to confuse the enemy's missiles as you try to maneuver him into your sights.

There is limited fuel for your trip to the enemy base. I lost almost as many games from running out of fuel as from getting shot down by enemy missiles. Crashing into the ground is also commonplace. You must watch your altitude and keep your wits about you at all times. It is easy to crash when you get distracted in the heat of battle.

You have four "Whizbang Waster" heat-seeking missiles and two rapid-fire cannons with unlimited ammunition. Firing opportunities aren't frequent, so take good advantage of them. Your missiles will home in on the target as long as it is in view.

continued on next page

You can shorten the time it takes to get to the enemy base by using the DHX-1's turbo-booster. Your current speed will double, but this consumes a lot of fuel. When you arrive at the base you must disembark after landing secretly with the chopper's "Whisper Mode." Now you must infiltrate the base on foot with the help of items provided for you or found on the base. There is a timer for this phase and you have five lives.

Throughout the compound, you will encounter guards loyal to the Mad Leader. As you did with the enemy choppers, you must fool them into believing you are one of the bad guys. You have papers which you show on demand. Sometimes they don't work, but you can still put doubting guards to sleep with your spray-can of sleeping gas. They won't remember anything when they wake up, but you better not be around to remind them.

The game instructions tell you to make a map of the enemy compound. This is a good idea, since there are many buildings, each with a number of rooms. Certain rooms hold items vital to the mission. As you advance through the game you will probably find, as I did, that you are using several maps.

Infiltrator comes in a simple package that includes a booklet of instructions and a quick-reference card. The instruction book is informative and humorous (your chopper comes with designer skids and stereo). The two main sections are the "Gizmo DHX-1 Owner's Flight Manual" and "The McGibbits Guide to Ground Installation Infiltration (Pocket Edition)." The quick-reference card gets you in the air and into the game fast.

Infiltrator will keep you happily busy for many hours, flying your chopper, deceiving the enemy and generally saving the world. I would recommend it for any dedicated computer gamer.—JOHN MANOR ■

$29.95, 48K disk. Mindscape, Inc., 3444 Dundee Road, Northbrook, IL 60062. (800) 221-9884.

CIRCLE 280 ON READER SERVICE CARD

BALLPARK FIGURES
continued from page 15

GETTING STARTED

With Ballpark Figures, you'll be able to hand your teammates statistical printouts that are sure to make you a hit. Type in Listing 1, BALLPARK.BAS, check it with TYPO II and SAVE a copy before you RUN it.

If you have trouble typing in the special characters in lines 1072-1074, don't type them in. Listing 2 will create them for you. Type Listing 2, check it with TYPO II, and SAVE a copy to disk. When RUN, Listing 2 creates these hard-to-type lines, and stores them in a disk file called D:LINES.LST.

To merge the two programs, LOAD "D:BALLPARK.BAS" and then ENTER "D:LINES.LST" — remember to SAVE the completed program before you RUN it.

When RUN, Ballpark Figures will load the sort routine, originally by Adrian Dery from the October/November 1982 **Antic**. The program will then present four numbered options—Print, Save File, Load File or Enter A Game.

Press [4] to enter a game. You do not need to press [RETURN]. The program will ask if this is the first game entered for this team. If so, you'll go directly to the lineup entry routine. If not, you'll be asked for the name of the team file that you want to work on. Enter the filename and press [RETURN] to LOAD the file.

Now you're ready to enter the starting lineup. Up to 15 players can be in the starting lineup. Enter the numbers of the starters in the order that they batted. You *must* enter *numbers*—such as uniform numbers—not names. If necessary, assign made-up numbers.

To avoid problems with misspelled names, etc., the program identifies players by number. Players' names are only asked for in game entry mode and whenever a player is found who is not yet in the team file. After entering the lineup, you'll go into game-entry mode. A large menu is displayed onscreen. You'll also see the current inning number plus the current player's name, number and position in the batting order.

To record a player's appearance at bat, select items from the menu based on what the batter did. For example, if he singled with runners on base, drove in a run, stole a base and scored, you would select:

A—Single
N—Men on base
K—RBI (runs batted in) and enter 1
L—Attempted steal—and enter Y for a successful steal
M—Scored a run

Then select option O to go to the next batter. It's that simple.

You can choose menu options either by entering the letter of an option or moving the cursor up or down with the [ARROW] keys without pressing [CONTROL]). An

continued on page 22

by GREGG PEARLMAN, *Antic Assistant Editor*

JACS Facts

Meet the Jersey Atari Computer Society

The nucleus of southern New Jersey's leading Atari users group began meeting at a computer store in the early 1980s. By the spring of 1983 this arrangement was no longer satisfactory, so the group found a hall and circulated flyers.

JACS, the Jersey Atari Computer Society meets at the Camden County Library in Voorhees, New Jersey, in the third week of each month.

MEMBERSHIP

JACS covers Camden County, the " 'Philadelphia region' of South Jersey," says former club president Bob Whipple. Some members come from neighboring counties or from Philadelphia itself. Another large, active club, JACG (Jersey Atari Computer Group), covers much of the northern state, neighboring on New York City.

JACS' 125 "memberships" consist of individual *and* family members, including some from other countries. "One guy from Saudi Arabia wants to join for information and the newsletter," says Whipple, "and there are members in Canada and Europe."

About 75% of JACS' members attend each meeting, but that percentage drops during the summer. "We have a strange mixture," says Whipple. "Many members are between 12 and 16, but they stop attending when they get their driver's licenses. Then we have the 'middle-aged' guys, 28 to 38, and the folks that are 50 to 65. Only about 10 women attend meetings, but one who joined recently has become the secretary—I don't mean anything sexist by 'secretary,' she just really wants to be involved."

Whipple says that JACS had the first 1040ST on the East Coast. "We invited Atari Corp. to our April, 1986 meeting. We rented a larger hall and about 450 people came. Then we bought some of the equipment they demonstrated." JACS loans the ST to members for a month at a time—free—and someone has borrowed it each month.

Most JACS members are technically oriented. Whipple is a systems designer. Past president Forrest Blood, who created the JAC-RAY demo (see photo) with Whipple's help, works for a company that makes motherboards. Others are engineers. Students also make up a large part of the group. JACS programmer Larry Nocella has been published in Tech Tips (*XL RAM-disk*, **Antic**, January 1987).

Importance of Atari uses to members are as follows:

1. Business/financial (SynCalc, SynFile+, etc.)
2. Word Processing
3. Productivity/Creativity (Print Shop, XLEnt software)
4. Games/Communications
5. Programming



NEW JERSEY
ATARI USERS GROUPS

JACS
(Jersey Atari Computer Society)
P.O. Box 710
Clementon, NJ 08021
(609) 346-1224—8-bit BBS
(609) 346-0611—ST BBS

JACG
(Jersey Atari Computer Group)
8 Crescent Road
Pine Brook, NJ 07058
BBS—(201) 298-0161

ACENNJ
(Atari Computer Enthusiasts of Northern New Jersey)
Hotline—(201) 748-8782

BBS AND NEWSLETTER

Between Bytes is the club newsletter, although actually there are two now. ST Potpourri is an ST newsletter published *within* Between Bytes every other month. Brian Colflesh edits both newsletters. The newsletters are printed on a dot-matrix printer in emphasized print, but the editors are trying to move over gradually to a laser printer.

JACS has two bulletin board systems. Brian Colflesh runs a BBS called Blitburg (formerly The IRS) on a 1040ST with a hard drive. He has set aside one SIG for the ST and one for the 8-bit to catch the overflow from the JACS bulletin board operated by Curtis Fickensher.

SPECIAL ACTIVITIES

JACS is involved in the annual Computer Festival at Trenton (New Jersey) State College. "At the 1986 show," says Whipple, "when Atari brought a 1040ST—which wasn't available yet—a hard disk drive, and the 80-column card prototype, people mobbed us."

The most recent special event was the successful Atari Fun Night in March, 1987. The meeting had "no format, no speakers, no business, no nothing." JACS invited some vendors of Atari products to come in for free and sell their wares. "We had about seven STs set up," says Whipple. "One was hooked to a Casio keyboard for

a MIDI demo, and two were linked together for Flight Simulator II. We set up our BBS there, and people who wanted to know how bulletin boards work could just walk up and try it out.

"People demonstrated word processing and games on the 8-bit, and one member did a voice demo that had a face with a moving mouth.

"A Broderbund representative was impressed with the size of our group and the percentage of people attending. He asked, 'Is this your normal draw?' and we answered, 'No, it's a little off this evening. We usually have standing room only.' And Ira Brickman of White Lion Software thinks we're one of the best users groups he's seen. We run into him at shows and he says, 'There's my buddies at JACS!'"

PRINT SHOP COLLECTION

One unusual project that JACS is known for in users group circles is its extensive library of Print Shop Graphics disks. Many of these graphics are not available from any other source, public domain or professional. No Frills Software currently markets the JACS icon disks commercially. (See "More Icons for Print Shop," **Antic**, December 1987.) JACS can still sell the disks, but No Frills packages them and is converting them for other machines.

"At our meetings we show the newest products and demos we can get, and we want club participation. Sometimes our guest speakers promise to come, but don't. Members feel taken in when they get the newsletter announcing a guest speaker, and then at the meeting someone says, 'Um, the guy called and says he can't make it.' One speaker did that two months in a row."

JACS is an official Atari users group dating back to pre-Tramiel days. The group doesn't countenance any kind of piracy and allows no demonstrations of "backup copies" — only original software is permitted.

"Our computers are for demonstration only," says Whipple. "They're put away right after the meeting. Sometimes people ask to make disk copies. No way. We follow the laws."

Newsletter-on-a-Disk

Unique ACENNJ Publication



Antic receives dozens of newsletters each month from Atari users groups throughout the United States, Canada, and even overseas. But the newsletter from ACENNJ, the Atari Computer Enthusiasts of Northern New Jersey, is different from all the rest—it's not on paper!

The ACENNJ Newsletter edited by Paul Tupaczewski is the first we've ever seen that comes on a disk.

Tupaczewski, author of *Bomb Squad* (Antic, June 1986) and *ASCII Art Converter* (July 1987) has put together a slick, colorful BASIC package combining editorials, columns, reviews, flashy graphics, standalone programs and digitized sound demos—including one that sounds suspiciously like Tupaczewski saying, "Here we go again" when the disk is booted.

This 8-bit newsletter takes up about 90% of both sides of a 5 1/4-inch disk. You can read the text files one screen at a time, or make printouts. The horizontally scrolling table of contents also allows you to choose local BBS news, Atari headlines, technical hints and even a game, in addition to the types of files previously mentioned.

The disk newsletter idea is clever and reader-satisfying. It's an approach that could well be considered by other Atari users groups who want to try something a little bit different.—GREGG PEARLMAN ■

DEMOGRAPHICS

About 70% or 75% of JACS' 8-bit members (and 45% overall) use the 800XL, and between 15% and 30% use 130XEs. (Some people have both.) According to Whipple, however, only 3% use 800s, and no one uses 400s, 600XLs or 1200XLs. JACS has 33 ST owners, of which 29 have 520STs and four have 1040STs.

In descending order, 8-bit people use the Atari 1050 disk drive, the Indus GT and the Atari 810. No JACS members use cassettes any more. No 8-bit users have hard drives, either, but about three ST users do.

Many JACS members have BMC-MX80 printers. "They were closed out," says Whipple, "and someone purchased the whole load and sold them under the name CTI. It's the club's favorite, printouts are nice." Several other members use Panasonic printers, and others use Epson. None buy Atari printers.

Whipple says that perhaps half of JACS' members own modems. The most popular brands are the Avatex 1200 and 1200HC, and the Atari 1030. Roughly 25% of the members use online services. But they access the JACS BBS and Blitburg all the time.

About 10% of the club members program. Top 8-bit languages are Turbo BASIC, ACTION! and BASIC XE—they rarely use Atari BASIC. ■

BALLPARK FIGURES
continued from page 19

asterisk appears next to each selected option to help you keep track of what you've entered. If you make a mistake, select option T to redo the current batter. To select FC (base reached on fielder's choice) or strikeouts, you need to press [CONTROL] along with G or H. When you're done, select Q to return to the main menu.

SCORING OPTIONS

Most game entry options will be self-explanatory to any baseball fan, but a few comments are in order:

For RBIs, option K, the program prompts you to enter the number of RBIs (1-4), or a G (to indicate a game-winning RBI). You must press G *before* the number of RBIs if it is the game-winner. And, naturally, you can only enter one game-winning RBI per game.

The only difference between option O, Next Batter, and option P, Next Inning, is that P increments the inning number and O doesn't—this is just to help you keep track of your place in the scorebook. So if you accidently select O instead of P at the end of an inning, don't panic. Simply select P after the next batter.

Option R allows you to make a substitution for the current batter. The program asks you to enter the number of the new player (and his name if he's not in the team file). It then returns you to the game menu with the new player's number and name at the top of the screen. You can now enter the plate appearance. To put in a pinch-runner, first enter the manner in which the batter reached base and *then* make the substitution. Now the pinch-runner will be credited for stolen bases or scoring a run, and the batter will be credited with the base hit, walk, etc.

Option S, Append Lineup, adds players to the end of the batting order so you to can handle those situations where you need to add players that show up after the game has started. This might happen in an impromptu softball game, for instance.

The program will not let you enter impossible events such as a single and a double in the same time at bat. It also "knows" when to select certain options automatically. For example, if you enter Option D, Home Run, the program will select Options M, Scored, and K, RBIs, if you haven't already selected them yourself.

MAIN MENU OPTIONS

You can save the team file to disk with option 2, or print an alphabetized statistics sheet. The printout option asks for a team name and a date to be printed at the top of the page.

Ballpark Figures was designed to work with Epson-compatible printers. If you're using another type of printer, edit line 211 and change:

```
LPRINT CHR$(15)
```

to the code(s) which put your printer into condensed mode (17 characters per inch). If you own a Genicom 3024-II printer, for example, you'd change line 211 to:

```
LPRINT CHR$(29)
```

because that's the printer code that puts the Genicom 3024-II into condensed mode.

The statistical headings for Ballpark Figures are as follows:

AB	Offical at-bats
AVG	Batting average
WMO	Batting average with men on base
SP	Slugging percentage
OBP	On base percentage
SF	Sacrifice flies
SH	Sacrifice hits (bunts)
H	Hits
2B	Doubles
3B	Triples
HR	Home runs
RBI	Runs batted in
GW	Game-winning RBI
BB	Bases on balls (walks)
R	Runs scored
SB	Stolen bases
SBA	Stolen base attempts
SO	Strikeouts
GIDP	Number of times the player grounded into a double play.

Obviously, the statistics generated by this program will only be as complete and accurate as the raw data in your scorebook. To fully utilize the features of this program, you will have to record such things as when substitutions were made, etc., while keeping score. And be sure to notice whether or not there were men on base when entering the data into the computer.

Here are the formulas and explanations for some common baseball statistics:

AVG	H/AB
SP	(H + 2B + (2 * 3B) + (3 * HR))/AB
OBP	(H + BB + HBP)/(AB + BB + HBP + SF + SH)
HBP	Hit by pitch
GW	The RBI that gave the winning team the lead it never relinquished. Not every game necessarily has a GW.

Serious baseball statisticians will want to know that WMO in this program actually measures hits per *plate appearance* with runners on base, as opposed to hits per *at-bat* with runners on base. ■

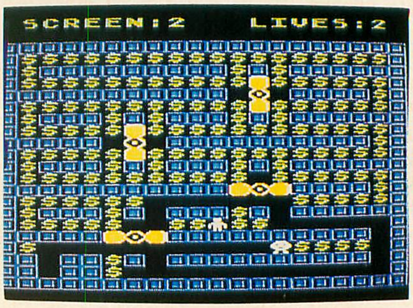
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*This is the second **Antic** appearance by Edward Brown of Indianapolis. His first was* Ave Maria, *a musical microscreen that was the December 1984 disk bonus.* *Listing on page 60*

By STEPHEN STOUT

1040 Terminator

Escape from the "simplified" tax maze



Rush frantically through the maze of new "simplified" income tax laws, grabbing deductions and dodging through loopholes to escape the dreaded auditing android. This BASIC program works on 8-bit Atari computers with at least 48K memory, disk or cassette.

Hmm. . . seems like only a year ago that you last came in contact with those jolly folks at the Internal Revenue Service. How time flies when you're in the middle-income tax bracket!

Once again you hippity-hopped down to that well-known accounting firm, Ed and Martha's Discount Tax Service, only to find that Ed is on the lam—charged with tax evasion. And Martha now runs a folk-dancing school for wayward rodents. You can't afford to take your taxes anywhere else, so you'll just have to do them yourself. Blecch!

You must be meticulous in filling out your IRS forms to avoid going into debt from tax payments or, like poor old Ed, requiring an operation carried out by a competent cosmetic surgeon. You must carefully navigate the maze of new simplified (ha,ha) tax laws, collecting as much money as you can. You must also use the few remaining tax loopholes to avoid the IRS auditor who has been assigned to your case.

Perhaps you could take some comfort in knowing that you're going through the same trauma as every other American—except Ed. But my conscience forces me to warn you that, unlike most people, you aren't being hounded by just any old IRS auditor. Because you have come under suspicion, as a longtime client of Ed and Martha's Discount Tax Service, the IRS sent their toughest field agent after you—the 1040 Terminator.

THE GAME

Is the Terminator human? Nobody knows. All I can say is that you'd better keep your hands and feet away from his mouth and don't stop running. The Terminator never gives up. He can't be stopped and he'll keep chasing you until he catches you. That's his job and the rumor is that he never loses an audit.

Take on the Terminator by typing in Listing 1, TERMINAT.BAS, check it with TYPO II and SAVE a copy before you RUN it.

If you have trouble typing the special characters in line 1760, don't type them in. Listing 2 will create them for you. Type in Listing 2, check it with TYPO II and SAVE a copy. When you RUN Listing 2, it creates these hard-to-type lines and stores them in a file called LINES.LST.

To merge the two programs, disk users LOAD "D:.BAS" and then ENTER "D:LINES.LST." Cassette users: CLOAD Listing 1, then insert the separate cassette used for Listing 2 and ENTER "C:". Remember to SAVE the completed program before you RUN it.

And don't worry about typing the data in lines 600-1720. It's not anywhere as difficult as it might look. These lines are merely different combinations of the same five characters: ampersand [&], space [ ], inverse number sign [#], inverse [CONTROL] [D] and inverse [CONTROL] [E].

Plug a joystick into port 1 and, at the title screen, press the button to start the action. 1040 Terminator is not too complicated, just intense. You're in a maze and your goal is to pick up all the dollar signs without being caught by the Terminator. If you get all the dollar signs, then you advance to the next screen. If you finish all five screens, you win the game, the Terminator is retired and Uncle Sam gives you a big fat simulated refund!

The Terminator is fast and tireless. But he just runs around the maze randomly, changing direction each time he bumps into something. He's like a chicken with his legs cut off. No, that's not quite right. Anyway, you only have two lives so if he catches you twice, you're history.

LOOPHOLES

As if all this great action and exciting storyline wasn't enough, the game has another feature. Naturally, you know that the only way to avoid the IRS auditor is via tax loopholes. As it happens, each maze has several strategically placed loopholes.

These loopholes are turnstiles which you can go through—but fortunately, they block the Terminator! This gives you quite a tactical advantage over him. Use the loopholes wisely though, or you may outsmart yourself and wind up right back in the clutches of the Terminator.■

Stephen Stout of Everett, Washington wrote last month's Adventure Creation Kit *as well as* Diamond Dave *(**Antic**, August 1987).*

Listing on page 57

Two Good Inexpensive Printers

Panasonic 1080i and Okidata 180

by GREGG PEARLMAN,
Antic Assistant Editor

The **Panasonic KX-P1080i** dot-matrix printer is not exactly new. However, a substantial number of **Antic** readers have sent in questions about using various programs with the 1080i. So we decided to obtain one of these Panasonic printers and see what made it so popular with Atari users.

Meanwhile, at the June 1987 Consumer Electronics Show in Chicago, **Antic** was impressed by the brand-new **Okidata 180** and asked to be put on the list for one of the first batch of review units.

As it happened, these two 9-pin dot-matrix printers arrived at **Antic** about three days apart. So although we're not really trying to rate the Oki and the Panasonic "against each other," it simply became more efficient to cover both the 180 and 1080i in a single article.



The bottom line is that these printers are both good, inexpensive products with adequate graphics capabilities. If either model is on sale in your hometown while you're out shopping for a printer, you wouldn't go wrong buying it.

The Okidata 180 is compatible with the Epson FX-80. The Panasonic is supposed to be compatible with an Epson RX-80, which **Antic** doesn't own. However, we did find that most of the 1080i control codes ran under our Epson drivers.

To work with Atari 8-bit computers, both of these printers require a parallel interface such as ICD's P:R: Con-

continued on next page

nection or the discontinued Atari 850. For an ST, they would simply plug into the parallel port.

PRINT QUALITY

Both machines delivered high-quality text printouts, but—at least on **Antic's** sample units—the Panasonic printouts were somewhat darker. Graphics printouts on the Panasonic were *much* darker, even with brand-new ribbons on both printers.

Each printer has several typefaces and pitches, but the Panasonic affords more combinations than the Okidata. For instance, you can print bold or double-width near letter-quality on the Panasonic. The near letter-quality font on the Panasonic is probably a more "classic" style than the Oki, but Okidata's near letter-quality printouts seemed "cleaner." Also, the Oki's condensed print is actually smaller than that of the Panasonic.

SPEED TESTS

With a short Atari BASIC program, I created a text file of exactly 20,000 characters to test print speed for each printer. The Panasonic printed the document at 83 characters per second in pica (10 characters per inch) and 19 characters per second in near letter-quality. Printouts of 62-sector Micro-Illustrator pictures came out in two minutes flat.

The Okidata 180 also printed the 20,000-character document at 83 characters per second in pica. However, near letter-quality speed was 31 characters per second. Both printers require two passes for near letter-quality, but the Oki prints the first pass from left to right and the second pass from right to left. Both Panasonic passes are from left to right. Micro-Illustrator graphics took three seconds longer than on the Panasonic.

The Oki, in addition to regular draft mode, has a "high-speed draft" mode which sacrifices a little print quality for speed. Pica print speed in high-speed increased to 94 characters per second, while elite (12 characters per inch) printouts yielded 109 characters per second, spewing out the seven-page, single-spaced test document in just over three minutes.

NOISES

The Panasonic is a fairly loud printer, whether it's printing text or graphics. The Oki is quiet when printing text, but when printing graphics it makes loud, distracting "wounded-animal" noises. On the other hand, unlike the Panasonic, the Oki 180 doesn't waste fanfold paper when you tear off a sheet after a printout.

GRAPHICS

With each printer connected to an Atari 8-bit computer, we printed pictures created on a 1040ST from the ST SCAN Image Scanner by Navarone Industries (reviewed in February 1988 **Antic**). These pictures were converted to RLE format, uploaded to the ANTIC ONLINE personal file-space on CompuServe, downloaded to an Atari 8-bit and, finally, converted from RLE to Micro-Illustrator format. The original ST printouts included some scanned or digitized images, as well as DEGAS-generated pictures and screen dumps.

The Panasonic, especially with a new ribbon, gives clean, dark printouts. The Oki printouts are clean as well, but not nearly as dark. On both, white lines are more noticeable than one would like. Also, the Oki often stops after printing about 10 lines, catches its breath for a few seconds before continuing.

A more significant problem seems to be that both printers' ribbons have a very short life—causing unevenness, especially in the Oki printouts. Panasonic guarantees its ribbons—the $12.99 KXP110i (or the KXP110 which also works)—for 3 million characters in draft mode. Okidata

```
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdef
9ABCDEFGHIJKLMNOPQRSTUVWXYZabcde
6789ABCDEFGHIJKLMNOPQRSTUVWXYZab
56789ABCDEFGHIJKLMNOPQRSTUVWXYZa
456789ABCDEFGHIJKLMNOPQRSTUVWXYZ
3456789ABCDEFGHIJKLMNOPQRSTUVWXY
23456789ABCDEFGHIJKLMNOPQRSTUVWX
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z0123456789ABCDEFGHIJKLMNOPQRSTU
yz0123456789ABCDEFGHIJKLMNOPQRST
xyz0123456789ABCDEFGHIJKLMNOPQRS
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdef
9ABCDEFGHIJKLMNOPQRSTUVWXYZabcde
6789ABCDEFGHIJKLMNOPQRSTUVWXYZab
56789ABCDEFGHIJKLMNOPQRSTUVWXYZa
456789ABCDEFGHIJKLMNOPQRSTUVWXYZ
3456789ABCDEFGHIJKLMNOPQRSTUVWXY
23456789ABCDEFGHIJKLMNOPQRSTUVWX
```

Panasonic 1080i draft and near letter-quality.

```
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdef
9ABCDEFGHIJKLMNOPQRSTUVWXYZabcde
6789ABCDEFGHIJKLMNOPQRSTUVWXYZab
56789ABCDEFGHIJKLMNOPQRSTUVWXYZa
456789ABCDEFGHIJKLMNOPQRSTUVWXYZ
3456789ABCDEFGHIJKLMNOPQRSTUVWXY
23456789ABCDEFGHIJKLMNOPQRSTUVWX
123456789ABCDEFGHIJKLMNOPQRSTUVW
Ø123456789ABCDEFGHIJKLMNOPQRSTUV
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xyzØ123456789ABCDEFGHIJKLMNOPQRS
ABCDEFGHIJKLMNOPQRSTUVWXYZabcdef
9ABCDEFGHIJKLMNOPQRSTUVWXYZabcde
6789ABCDEFGHIJKLMNOPQRSTUVWXYZab
56789ABCDEFGHIJKLMNOPQRSTUVWXYZa
456789ABCDEFGHIJKLMNOPQRSTUVWXYZ
3456789ABCDEFGHIJKLMNOPQRSTUVWXY
23456789ABCDEFGHIJKLMNOPQRSTUVWX
```

Okidata 180 draft and near letter-quality.

ribbons cost $8.95 each.

DOCUMENTATION

The Panasonic manual runs 112 pages and the Okidata manual is 90 pages long. The Panasonic illustrations are a bit confusing, but the text does a good job of leading the reader by the hand. The overall look of the Okidata manual is uneven and somewhat drab. And as far as that Oki documentation is concerned, computers are divided into two categories—Commodore and Everything Else. In fact, about 30 pages are entirely Commodore-specific.

OVERALL

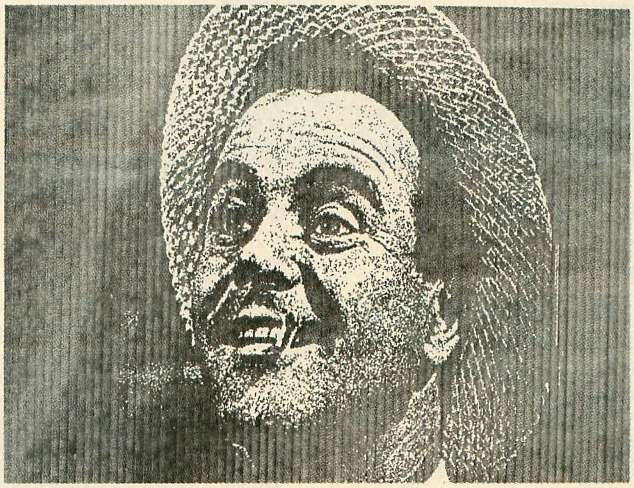
Either printer is worth having. They're both faster than any of the **Antic** editorial department's present 9-pin dot-matrix printers and they're at least as easy to use. However, the customer support at Panasonic is thorough and helpful—a clear edge over Okidata, whose 800 number is virtually inaccessible. ■

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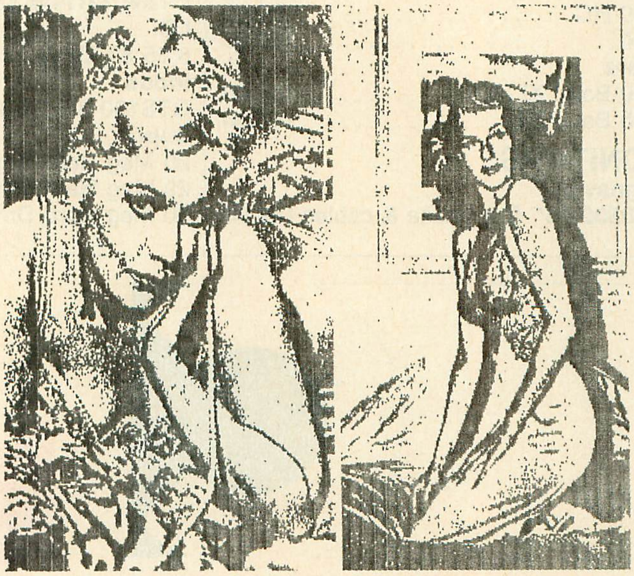
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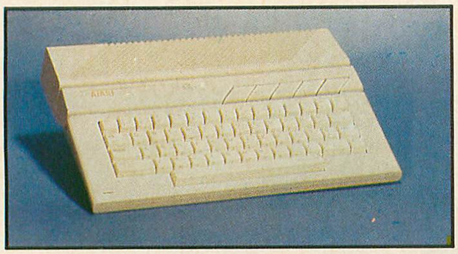
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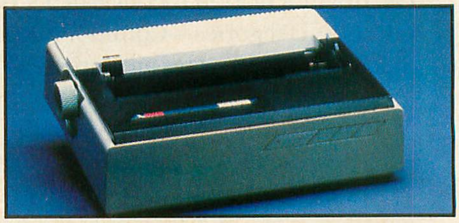


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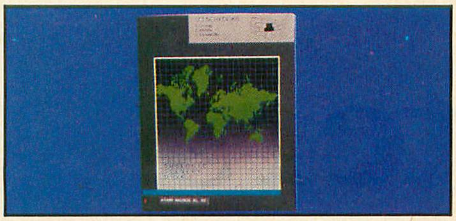
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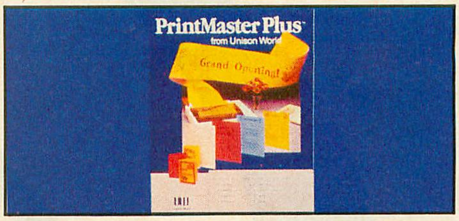


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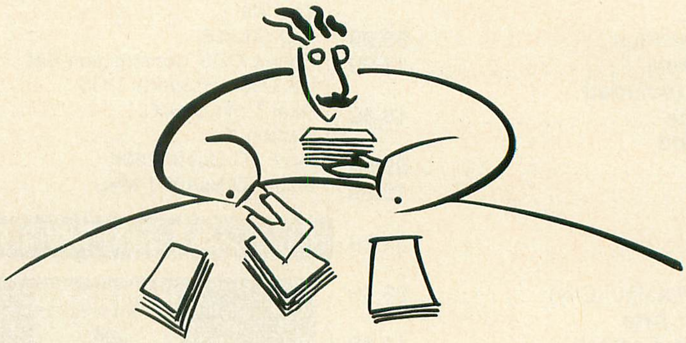
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Super Sorters

Part I: Multikey Sort Routine



By KEVIN PECK

A multikey sort will sort your data by a primary "key field" and then sort by a secondary field *within* that key field.

A common example would be to sort a mailing list by last name—with all first names then sorted *within* each last name. Our multikey sort routine can also handle the job when you need to sort by just one field.

Listing 1, MULTISOR.DEM, is a short BASIC demo that shows off some of the features of this speedy USR routine.

Type in listing 1, check it with TYPO II and SAVE a copy before you RUN it. If you have trouble typing in the special characters in lines 1010-1030, don't type them in. Listing 2 will create them for you.Type Listing 2, check it with TYPO II, and SAVE a copy. When you RUN Listing 2 creates these hard-to-type lines, and stores them in a file called LINES.LST which contains the BASIC statements defining the machine language sort routine.

To merge the two programs, disk users LOAD "MULTISOR.DEM" and then ENTER "D:LINES.LST". Cassette users: CLOAD Listing 1, then insert the separate cassette used for Listing 2 and ENTER "C:". Finally, remember to SAVE the completed program before you RUN it.

To use this sort routine in your own BASIC programs, you'll need a line that calls the routine, plus some information to sort in another string.

Multikey Sort begins a two-part series of powerful machine language sorting routines that will be extremely useful for intermediate BASIC programmers. This USR routine works on Atari 8-bit computers of any memory size, with disk or cassette.

SORTED DETAILS

Here is the format for the USR call that starts the sort. See lines 290, 360 and 430 for working examples of this line.

A=USR(ADR(MKS$),FIRST,LAST,FLEN,FOFF,SLEN, SOFF,RLEN,ORDER)

Below are the elements within this format:

ADR(MKS$) is the address of the machine language routine, MKS$.

FIRST is the starting address of the data to be sorted. Since the data is contained in D$, put ADR(D$) in place of FIRST.

LAST is the ending address of the data to be sorted. Calculate the ending address by adding the length of the string to its starting address. The formula for this is:

LAST=ADR(D$)+LEN(D$)

FLEN is the length, in bytes, of the first field to sort on, the key field.

Figure 1

field	field length
Last Name	7
First Name	6
Position	10
Record Length	23

FOFF is the offset into the record where the first field begins.

SLEN and SOFF are the same as FLEN and FOFF, except that they define the *secondary* field for the sort. If you pass a value of 0 for SLEN, the routine will sort on the key field only.

RLEN is the length of the record being sorted. You must use fixed length records within a single, big string for the sort to work. All extra spaces in the record must be padded with the character of your choice, usually a space (ASCII 32).

ORDER is the order in which to sort the data—either ascending (pass a value of 0) or descending (pass a value of 1). Any non-zero value will produce a sort in descending order.

The demo program you created has three sample sorts. First it prints out the unsorted data and asks you to press the [SPACEBAR]. Next it sorts the data by last name (key field), with the first name (secondary field) sorted in order *within* the last name. This is done in line 290. The second sort in line 360 puts the data in order by "position" (key), then by last name (secondary) within each position. The final example sorts the data by the first name only, in descending order.

The program uses a record with the structure shown in *Figure 1* for all examples. The table shows each field name and its length in bytes. Notice that not all of the field lengths are equal. Only the total record length must be consistent throughout the data for the sort to work. You must pad extra spaces in each record on a per field basis.

If you have data for a record where the last name is five characters long, the first name is four characters and the position is 10, for a total of 19 characters, you *cannot* simply add four spaces to the end of the record to get it to equal 23 characters. You will have to add two spaces to the last name to make it seven characters long, then add two spaces to the first name. (You can leave position alone because it's already the proper length.)

Figure 2

```
                   1         2
         12345678901234567890123
         -----------------------
WRONG:   SmithMikeProgrammer
         HunterBarneyDriver
         JohnsonJillTrainer

                   1         2
         12345678901234567890123
         -----------------------
RIGHT:   Smith  Mike  Programmer
         Hunter BarneyDriver
         JohnsonJill  Trainer
         -----------------------
         7      6     10
```

continued on page 35

1987 Federal Income Tax Spreadsheet

Antic's fourth annual 1040 SynCalc template

***Antic*'s three previous Federal Income Tax Spreadsheet Templates have been among our most popular annual features. Now you can calculate your 1987 federal income taxes on your 8-bit Atari. (ST owners will find templates for the VIP Professional and A-Calc Prime spreadsheets in the Spring 1988 issue of START.) Requirements for running the 8-bit Atari template are minimum 48K memory, a disk drive and SynCalc spreadsheet software ($49.95) from Broderbund. A printer is optional, but you'll need your official Internal Revenue Service 1987 tax instructions and forms.**

•

by TOM CHANDLER

THIS IS THE YEAR when you must face all those major changes in the Revised Federal Income Tax Law. But at least you can count on much less hassle when you do the number crunching wih your 8-bit Atari, SynCalc spreadsheet ($49.95, Broderbund) and **Antic's** Fourth Annual Income Tax Template. This IRS tax template will make it simple for you to experiment with various alternative "what if" strategies for minimizing the taxes you owe.

The Fourth Annual **Antic** Federal Income Tax Spreadsheet Template includes fewer forms than

continued on next page

Tom Chandler has a degree in finance and is a marketing employee of Antic Publishing.

in previous years, because of the new "simplified" tax law. (For example, there's no more Income Averaging deduction.) So for 1987 you'll get:

IRS 1040 Long Form

Schedule A (Itemized Expenses)

Schedule B (Interest and Dividends)

We use SynCalc software for the **Antic** tax templates because SynCalc is still the most widely used 8-bit Atari spreadsheet that will perform income tax calculations. If you don't have a printer, you can just hand-copy the figures from the screen to your printed IRS forms.

Even if you've never used SynCalc before, you should be able to work through the well-written manual in a few hours and learn enough to use this tax template. But you're leaving yourself open for unnecessary aggravation if you try to start working on the tax template without taking enough time to become adequately familiar with SynCalc.

Please, if you need help with SynCalc, phone Broderbund Technical Support at (800) 527-6263—not **Antic**! However, if any last-minute fixes are needed in the template itself, the information will be on CompuServe's ANTIC ONLINE. (Type GO ANTIC when you log onto CompuServe. Then choose the Mailbox selection from the main menu and go to the Error Log section.)

Sorry, under this year's new laws you cannot deduct any tax preparation expenses—such as this issue of **Antic** and the monthly disk, or your online time-charges for accessing tax information.

Please be careful and use common sense in figuring out yout tax return. If you doubt the accuracy of the template findings, check with a registered tax preparer. User and programmer errors are always a possibility. **Antic** can't take responsibility for any mistakes made in your tax return as a result of using this template.

TAX SPREADSHEETS

Spreadsheet programs are an ideal tool for preparing tax returns. You type in personal data such as income and deduction amounts, and customized formulas tell the spreadsheet how to compute the tax obligation from your data. Each data element or formula is entered in a "cell" with an address—similar to the lines and columns on the tax form. As your data changes (if you find another receipt, for example), just go to the proper cell, type in that number and press [START]. Your entire tax return will begin to recalculate.

Important: please remember that SynCalc calculates by rows or columns—so this template must be calculated at least *five times.* Press [START] five times after changing any figure.

You'll need the official 1987 Internal Revenue Service tax instructions and forms nearby. There isn't enough Atari memory to duplicate the forms exactly, so abbreviations are used wherever possible. But the template follows IRS line numbers, so you won't get lost.

After you enter the information into the spreadsheet, it calculates every line except the actual tax you owe. Putting all the tax tables into the template would chew up memory and typing time. So when you determine your Net Taxable Income on the template, look up the matching tax obligation in the Tax Table or Tax Schedule in your IRS instruction booklet.

The spreadsheet template can be re-used for many different 1987 tax returns if you retain a blank version on disk. Entering a taxpayer's personal data should take about an hour. Save each completed tax template under a different filename.

This long, narrow template consists of 149 rows (out of a possible 255 maximum) by four columns. You *don't* need to type in any schedules or forms that you won't use—the 1040 form will work without them. If you type in template sections that you later decide not to use, just leave those cells blank and they won't become part of the overall calculations for the return.

TEMPLATE TYPE-IN

Antic Disk owners will find this template on the monthly disk under the filename TAX1040.SC. You'll need to boot SynCalc before loading TAX1040.SC.

For the purposes of this article, I must assume that you're familiar with SynCalc. For instance, you should know that pressing [OPTION] starts a command sequence, how to move around within the spreadsheet, etc. Keep your SynCalc manual handy, if you have any doubts.

Format a blank disk for data. Before typing anything in, set the column widths as follows: column A, 4; column B, 36; columns C and D, 9 each.

Set GLOBAL FORMAT to PRECISION 0 (to round off cents to the nearest dollar) and COMMA (to insert commas in numbers like 1,000). To speed up data entry, issue the command GLOBAL RECALCULATE MANUAL. Also, set calculation to ROWS.

In this year's template, the IRS form line numbers are in 4-width column A and the text descriptions are in 35-width column B. The actual figures and formulas are in 9-width columns C and D. While entering titles in column B, set FORMAT JUSTIFY LEFT. When entering the numbers and formulas in columns C and D, set FORMAT JUSTIFY RIGHT.

The template is divided into separate sections, one for each tax form or schedule. Each section has two parts. Part A is the format set-up: titles, labels, etc.—with zeros (0) temporarily standing in for your actual number and formula locations. Part B contains the formulas. I'd suggest starting at cell A1 and working down column A using SynCalc's automatic cursor movement. Then go to column B and enter the titles.

You might consider typing in and testing each section before proceeding to next one. Part A of each section starts with the SynCalc row number. *Don't* type in these row numbers. The tax form line numbers are under the dashes for column A. You must enter all numbers and formulas in the *exact cells* shown, or else the template won't work.

Here's a data compression tip: SynCalc uses 16 bytes

SUPER SORTERS
continued from page 31

This is what I mean by adding characters on a per field basis. Your database does not have to look anything like this—it doesn't have to have a 23-character record length either: there just has to be a fixed length for all records for the sort routine to work.

Now for a detailed explanation of all of the parameters for the routine. In the first example, we'll need to use 7 and 6 for the lengths of the first two fields. Just use the lengths presented in *Figure 1.*

The "offset" seems strange, but it's easily explained with some examples. Just add up the lengths of all the fields preceding the one you are going to sort on. The field named "position" has an offset of 13 (that is, 7+6), the lengths of all the fields before it. The "last name" field has an offset of 0, as there are no fields in front of it. The "first name" field has an offset of 7—the length of "last name" field, the only field preceding it.

You may sort any two fields, regardless of their order in the record itself. In the second example, starting at line 320, we're sorting by the position first, then the last name. Though the last name appears first in the data record, it is still a valid sort. Just choose the two fields you want to sort on, and call the routine.

An example of sorting a single field is presented in the demo starting at line 390. I also chose to sort the data in descending order to show you how the order flag operates.

Notice the two zeros (00) after the 7 in line 430 of the single key example. The first one *must* be a zero for a single key sort because it's the SLEN, or second field length. This zero tells the routine that we only want to sort off one field. The next zero will not affect anything because the routine only checks for the first zero.

You should usually pass this value as a zero to make single field sorts easier to spot within your program. The final number is a one this time—to do the sort in descending order instead of ascending order as in the three previous examples.

RUN the demo program and see what happens to the data onscreen after each sort.

NOTE: you can't sort one field in ascending order and the other in descending order. Both must be sorted in the same order. The largest string you can sort is 32K. This restriction is imposed by Atari BASIC, but I do not forsee many applications reaching or exceeding this limit.

To conclude this two-part series, **Antic** will present another machine language routine that sorts floating point numbers within strings and will also sort variable length numbers and a mixture of positive and negative numbers. ■

Kevin Peck is a computer science major from Salina, Kansas. His Word Searcher *appeared in the March 1987* ***Antic.***

Listing on page 65

FEDERAL '87 INCOME TAX SPREADSHEET
continued from previous page

to store every number. Text entries take only four bytes, plus one byte per character. Unless you use a number in a calculation, enter it as text. In fact, all form line numbers *must* be text. Start each text entry with quotation marks (") or you'll run out of memory.

The last step in Part A is to enter all the zeros. The zeros "hold open" the cells for formulas and values to come later. Most zeros are in columns C and D. As you enter them, use this undocumented tip: the /K command toggles automatic cursor movement on and off. Also, you can move the cursor arrows in a menu without holding down [CONTROL].

Now that the template format is typed in, use Part B of each section for cell formulas. The listing shows each cell address, followed by the entry. *Don't* type the cell addresses (such as C133) shown in the first three or four spaces at the left. Instead, *go to* that cell and type in the formula, typing over the space-holding zeros entered earlier. A formula element like D122 is not text—type it as +D122 so that SynCalc will know it's a numeric entry. As you enter each formula, protect it with a /FO (FORMULA PROTECT ENTRY) so you won't accidentally write over it.

TIPS & TRICKS

Because this template pushes SynCalc to its limits, you'll need to use some advanced spreadsheet operation techniques in order to get everything working properly. Since SynCalc occasionally wastes a few cells, if you get the famous ERROR 100 NOT ENOUGH MEMORY message, save the file immediately. Now erase the file in memory with the /E command and then reload the file from disk. This save/erase/load process deletes unnecessary entries.

To squeeze in long cell formulas, don't type spaces between words. Even more importantly, when you first type in the formulas, leave out words like THEN, ELSE or LOOKUP. Then press [RETURN]. You'll get a SYNTAX ERROR message because of the missing words, but go back and enter those words with the [CONTROL] [INSERT] keys. This lets you put an "illegal" amount of characters into a cell. The final characters will be pushed off the screen, but they're still in memory. (There are limits, of course—don't insert more characters than you need to.)

After you correctly type in the complete spreadsheet template, remember to save a blank copy under a name like BLNK1040 before entering any taxpayer data. Loading that blank file lets you do returns for many different taxpayers—just save each return with a different filename. ■

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Listing on page 63

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Astounding Virtuoso Art/Music Animator

Virtuoso Software's **Desktop Performance Studio** ($49.95) is the most original application for Atari XL/XE computers since Print Shop. (It does *not* run on 800/400 models, even those with memory upgrades.) Virtuoso's Desktop Performance Studio, which most people will probably just call "Virtuoso," propels the 8-bit Atari into the exciting new world of desktop video, which I think will be the hottest topic in computing for the next couple of years. It will replace desktop publishing as the glamour application for our post-literate generation.

Desktop video is the production of computer images that are comparable to a movie or television show. Usually this implies animation and sometimes sound. The computer, often coupled with a VCR or camcorder, offers creative potential previously unavailable. The problem has been in controlling the vast amount of information needed for this type of work. You used to need assembly language programming skills to make it work, and even then it was extremely difficult.

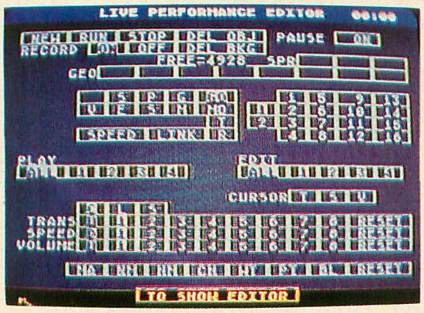
Virtuoso changes all that. Now any Atari user can design complex animated music videos and make them work. The amount of control over your computer which Virtuoso provides is truly astounding. Earlier programs such as the Arcade Machine, Movie Maker and Colourspace all offered interesting approaches, but none ever put it all together the way Virtuoso does.

PERFORMANCE BUILDING

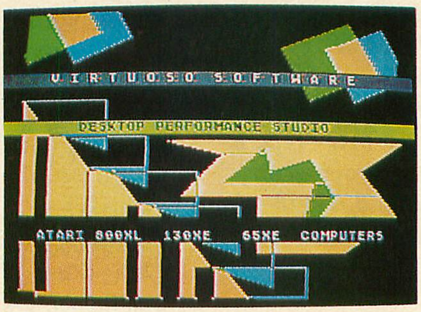
The design and construction process in Virtuoso is modular and very logical, also very powerful. You build your show in layers. Virtuoso has its own special vocabulary. Every basic element is viewed as a "shape"—whether it's a text message, graphic design, or musical phrase. Animation techniques are the tools for activating these shapes.

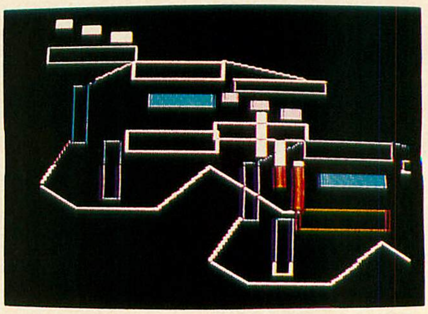
Rotation, scale (size) and path (movement route) can be applied to graphics. Shift (tranposition), volume and envelope are music manipulations. Design your various shapes and save them in their respective libraries. Then design and save the animations.

Reviewed by Charles Cherry



Editing screen in Virtuoso Desktop Performance Studio.





Animation screens made by Virtuoso Desktop Performance Studio.

The shapes are independent from the animations. Any musical phrase can be assigned to any envelope. Duplicates of the same object can simultaneously follow different paths across the screen. Particularly effective combinations of shapes and animations can be saved as objects. Any and all shapes, animations, and objects—in any combination or arrangement—can be used anywhere in the show, or even in a different show.

An independent linker lets you preset intricate relationships controlled by the music or its animations. For example, the rotation of a graphic shape could be controlled by the volume of a music passage.

After you've got all the elements, you plug them into a master timeline to create your show. The authors claim this is so simple that you can do it as a live performance in real time. Perhaps—with lots of practice.

Actually, I found Virtuoso's possibilities overwhelming and the many selections in the main menu somewhat intimidating. Hopefully, experience will turn that bewildering array into a screenful of old friends. I'm just glad all that power will be there when I'm ready for it.

USING VIRTUOSO

You do all your creating with elegant (and comprehensive) menus using the keyboard, a joystick, or a graphics tablet. The graphics tablet works best, and Virtuso supports them all—Suncom's Animation Station, KoalaPad, and Atari Touch Tablet. Of course no user interface will please everyone, and I have a few gripes about this one. I wish it was easier to move around the timeline and I wish the CLEAR command was protected from accidental erasure. But, overall, the menus are very effective.

Virtuoso uses the Atari's memory very efficiently and the performances can be surprisingly long. After you have the libraries of elements, using them requires very little memory. Simple animations can run more than *90 minutes*—which is quite incredible. Editors for creating the various

continued on next page



The Virtusonics Corp. team. Front: R&D Director Frank Schwartz in lab coat, President Joseph Lyons in white tie and tails. Rear: Chairman/CEO Richard Lewis, Marketing Director Jack Godler.

The Story Behind Virtuoso

By GREGG PEARLMAN, *Antic Assistant Editor*

About eight years ago, Joseph Lyons and Frank Schwartz decided that the way sound was *usually* viewed in technology wasn't necessarily the best way. So the two New Yorkers developed their own method of arranging information to present it more expressively. "As a result, we ended up in Atari Land," says Lyons, "because the 8-bit Atari was a good, inexpensive computer—we didn't have much money—and for a couple of hundred bucks we had four voices and colors."

They called the results of their work "Virtuoso" — a fully realized software philosophy. They added graphics, text, animation and telecommunications. All of this took much time and work. Longtime **Antic** readers will probably remember our enthusiastic preview of this product in June 1985, when Virtuoso consisted of nothing but a graphic music editor.

Desktop Performance Studio (reviewed in this issue) is the long-awaited commercial debut of Virtuoso, but many other applications are possible. In fact, Lyons and Schwartz's Virtusonics Corp. has begun licensing Virtuoso software for other applications, such as marine navigational plotting. Lyons says that the goal of Virtusonics Corp. is to license Virtuoso technology to anyone who wants to develop an application requiring that kind of flexible data processing.

Virtuoso's co-developers come from widely different backgrounds. Lyons, the president of Virtusonics, was a professor and conductor at New York's Juilliard School. Schwartz, the vice president of research and development, spent over 20 years on what he calls "the leading edge" of computer technology, pioneering highly successful projects on micro, mini and mainframe computers. "I don't like being the second person to do something," he says. "I want to be first. 'Me too' isn't good enough—I want it to be 'Me *one*.'"

NEW OPERATING SYSTEM

Schwartz says, "In creating Virtuoso, we basically tossed out the existing Atari operating system and put in our own, because Atari DOS just

continued on next page

wasn't compatible with what we wanted to do." The Virtuoso software is an 18K core around which Lyons and Schwartz built the Desktop Performance Studio. The whole thing is written in assembly language. Roughly 1.2Mb of source code reduces to about 70K of object code on disk.

The Desktop Performance Studio is as about as much of the Virtuoso technology as they could fit into the 8-bit Atari. "Versions in more powerful machines like the ST will be astonishingly more extensive than what you see here," says Schwartz.

Basic ports of Virtuoso to other computers are being contracted to "conversion houses" with the fine-tuning to be done in-house at Virtusonics. A Commodore 64 version is already being tested at the Virtusonics offices in upper Manhattan. Contracts have just been signed for transferring Virtuoso to the Atari ST and the Apple IIGS.

"Our real concentration is in expressing information so that it can be summarized, transmitted and re-created," says Lyons. "We feel that we have a very sophisticated package that doesn't follow 'traditional' lines of thinking, especially in terms of music and graphics. We've tried to provide something experimental and innovative so that a person doesn't have to say, 'I don't want to do another painting' or, 'I can't read music.'

"We're trying to introduce a new kind of thinking about software, and a new kind of thinking about *thinking* in which creative material is combined and accessed. I think our greatest achievement in this program is the flow of the editors—from the music editor to the text editor to the graphics editor to the live performance editor to the storyboard editor to telecommunications, etc."

Lyons and Schwartz are well aware that the program has limitations. There are some standard things in both music and graphics that aren't available. They chose not to add them "to leave people free to think in another way."

"Frame-by-frame animators are still fairly picture-oriented," says Lyons. "We wanted people to be able to take an abstract shape, spin it around, add another one, take it away, add another one—creating a kind of personal lightshow with music that's easy to compose by moving the cursor with the touch tablet and drawing lines up and down the steps—instant music. You don't have to know what D-major means, or 4/4."

Lyons continues, "In fact, it's very difficult to write in D-major or 4/4 using Desktop Performance Studio—it's almost impossible. The software is not designed for that. It's designed to provide a whole new level of freedom. We think it's unique. It provides—in real time—all these graphics and instantaneous changes—delete, insert, background, change the path, change the scale, shape, speed, color, music—all at the click of a switch."

MARKETING PLANS

'We're targeting the Atari users groups in our first round of marketing," says Lyons, "not only by mail, but by visiting all the groups that we feel still have a good number of the active 8-bit activists. I've been to a number of user faires and each month we visit one or two groups.

Virtusonics Corp. spends a lot of time online—on CompuServe, GEnie, and their own new Virtuoso Think Tank BBS which has all the play object files as well as the help text and demos. (Information about how to log on is provided in this issue's Virtuoso review.) "Lots of people are uploading their pieces to both the BBS and the online services," says Lyons. "We're slowly getting people not to be so shy about uploading them. They'd been very hesitant."

continued on page 44

elements are loaded into memory only when needed. This keeps the basic program small. In a 130XE the editors are loaded from the RAMdisk and are available immediately. With the 64K Atari XL/XE computers, you must wait a moment for them to load from disk. XL memory upgrades that are fully compatible with the 130XE should be able to run Virtuoso at 128K RAM level.

MUSIC & GRAPHICS

The music is the most completely realized part of Virtuoso—appropriate, considering that the program began its three-year development strictly as a music editor. It is expected that you will write short phrases which can later be strung together in various patterns—just as you do with a drum machine. But you can write long pieces if you wish. The envelope editor gives you synthsizer-like control over the sound, and Virtuoso can play all four of the Atari's voices simultaneously. Very complex music and a variety of instrumental types are possible. My only quibble is that you are limited to music—there's no way to create sound effects.

Virtuoso's graphics capabilities are also very impressive, especially if you understand the limitations of the 64K Atari computer. It's fun to draw shapes, then watch them spin and fly around the screen. And it's easy.

Shapes have some limits and want to be simple geometric figures. You can draw more organic shapes, but it slows down the movement. Nevertheless, this is easily the most powerful animator ever available for the Atari. And I suspect that once some talented artists have a shot at it, the limitations will be less visible.

TEXT & ONLINE

By comparison to Virtuoso's high-powered music and graphics, the text capability is pretty limited. Text can be only one size, Graphics 0. Text "regions" must extend all the way across the screen and cannot contain any graphics. Custom character sets are not available, including the Atari built-in international set. Text cannot scroll vertically. Still, it's better to have

even this crude level of text editor than no text possibilities at all.

To me, the most surprising (and puzzling) part of Virtuoso is its reasonably complete and useful built-in modem program. This online software has dial directories and macros and could compete as a standalone product. However, since Virtuoso shows can be transferred with any modem program, it seems an unnecessary bonus that might better have been exchanged for additional desktop video features.

But I suppose that built-in telecommunications does make it easier for groups of people to develop shows jointly, or exchange libraries, etc. Online Virtuoso would really come into its own with two people working side by side—perhaps one might develop music while the other develops graphics. They could effortlessly pass stuff back and forth through a null modem. Unfortunately 1200baud is the fastest rate Virtuoso supports, so it could be just as fast to hand the disks to each other.

In any case, the telecom features don't hinder the performance of the rest of the package, and I guess I should applaud the publisher's determination to make Virtuoso a product that does not require any additional supporting software.

ONLINE SUPPORT

As befits a product which opens a whole new field of computer endeavor, Virtusonics Corp. is supporting Virtuoso fully. There is an entire CompuServe data library and message base dedicated to it. (After you log on, type GO ATARI8 and then at the next prompt type dl13.) Virtusonics also spends time on GEnie. And the company recently opened their own 24-hour bulletin board, Virtuoso Think Tank, at (212) 865-2596.

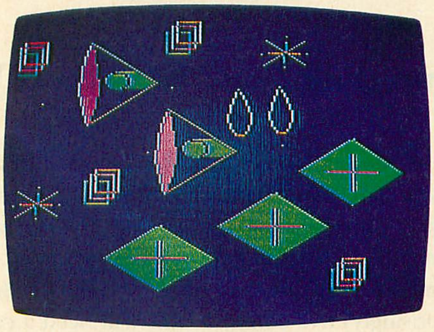
On any of these online resources you can get your questions answered by the authors or other users. And you can upload your latest masterpiece or download someone else's. After you obtain other shows, you can use and modify the libraries—which should quickly lead to marvelously complex

continued on next page

Super Disk Bonus

Four New Desktop Video Animations

By the Co-Author of Virtuoso



Antic's monthly Super Disk Bonus has delivered one great surprise after another and this month is no exception. To go along with the current issue's review of the exciting new Virtuoso graphics/music software, the disk has four exclusive new animation shows—complete with soundtrack—from Joseph Lyons, the former Juilliard professor who cowrote Virtuoso.

You can view these lengthy and ambitious computer graphics extravaganzas without owning Virtuoso software. The April 1988 Super Disk Bonus also includes the Virtuoso Player Program—a 192-sector machine language program that is *not* part of the commercial product.

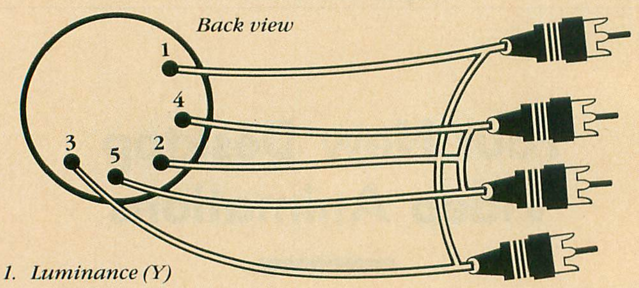
Virtuoso is written entirely in assembler, so this month's Super Disk Bonus consists of more than 350 sectors of high-powered machine language code. These bonus programs will run on any 8-bit Atari computer with at least 48K memory. See the HELP file on Side B of this month's disk for instructions on how to use the Super Bonus programs.

Your April 1988 Antic Disk—also featuring the new '87 IRS Tax Template as well as every other program in this issue—will be shipped to you within 24 hours after receiving your order. Just phone Toll-Free to the Antic Disk Desk at **(800) 234-7001**. The monthly disk is only $5.95 (plus $2 for shipping and handling) on your Visa or MasterCard. Or mail a $5.95 check (plus $2 shipping and handling) to Antic Disk Desk, 544 Second Street, San Francisco, CA 94107.

Programmers: **Antic** wants to see your most ambitious programs, even those too large or complex for printing as a type-in listing. High-quality programs in any language that has a runtime version are now eligible for consideration as a Super Disk Bonus. ■

Virtuoso Super Bonus and the SynCalc 1987 Income Tax Template—
only $5.95 on the Antic Monthly Disk!

Figure 1.



1. Luminance (Y)
2. Signal ground
3. Audio
4. Composite NTSC video
5. Chrominance (C)

Connecting Your Atari to a VCR

Although the Atari computer can be connected to a video cassette recorder through the antenna input (just like a television set), much better quality will result from using the VCR's video and audio inputs. This is the same as connecting an Atari to a monitor.

The monitor jack on the Atari is called a 5-pin DIN. It's a round plug with (not surprisingly) five contacts. You will need a cable that comes with a 5-pin DIN plug on one end and four RCA plugs (used by most VCRs) on the other end. Fortunately, this is a pretty common and inexpensive cable—**Antic** uses a lot of them for monitor connections. The cables should cost about $10 for a six-foot length and are available at most electronics stores and some computer stores. (However, Radio Shack no longer seems to carry them.) If you can't find the cables, you could build one from the diagram in *Figure 1*.

Now that you have the cable, how do you use it? After all, it comes with *four* RCA plugs and the VCR has only *two* input jacks. Well, you'll generally need to experiment—unless the four plugs are clearly labeled (usually they're just color-coded or numbered).

Whenever I get a new cable, I usually just try all the plug combinations until the sound and the picture both work right. You can't hurt anything by plugging into the wrong holes. When you do identify the correct plugs, label them clearly for future reconnections.

The purposes of the four RCA plugs are as follows:

1. Audio: Plug it into the audio input of the VCR. If you want to run a stereo VCR, you can use a "Y" connector.

2. Video: Plug it into the video input of the VCR. This plug has an industry-standard NTSC composite video signal.

3. Luminance: Let this plug dangle. It is a black and white video signal carrier used with monochrome monitors. As it happens, it is also the "Y" of the YC standard for the new Super VHS video recorders. The YC standard is the old separated video which many Atari owners have used for years with the Commodore 1702 monitor (and a few others). Yes, the Atari can produce this superior picture and take full advantage of the "new" technology.

4. Chrominance: Let it dangle too. This is the color part of the video picture. It is the "C" in Super VHS YC. The 800XL does not produce this signal. But you can substitute the NTSC composite signal (2 above) for good results with Super VHS. ■

and beautiful Virtuoso productions via these merged efforts.

There is also a public domain player, available on CompuServe and from users groups, which allows Atarians without Virtuoso to see the performances. Curiously, this player was not included with the program package.

(*This month's Antic Disk contains the 194-sector Virtuoso player program plus four exclusive 52-sector shows from the software's co-author. This demonstrator will run on a standard Atari 800 as well as on the XL/XE models.*—ANTIC ED)

DESKTOP VIDEO ON VCR

Although most of these performances will live only in Atari computers, they can reach much larger audiences through video cassettes. Any Virtuoso show can be recorded in any video format. The Atari produces the best video signal of any 8-bit computer and has been used in many professional applications. Atari even supports the new YC standard for Super VHS. If you have access to more sophisticated video equipment, a Virtuoso show can be mixed with material from other sources. The only limit is your imagination.

Hooking up an Atari computer to a video cassette recorder (VCR) is easy. Connect the television cable from the Atari to the VCR antenna input for passable results. But using the VCR's direct video and audio inputs works much better. See this story's sidebar for more detailed instructions on Atari-VCR connections.

There's really no way to do full justice to Virtuoso in a magazine review. I encourage you to get the public domain player and check out some available performances. The early shows are simple, but even these demonstrate the potential of the system.

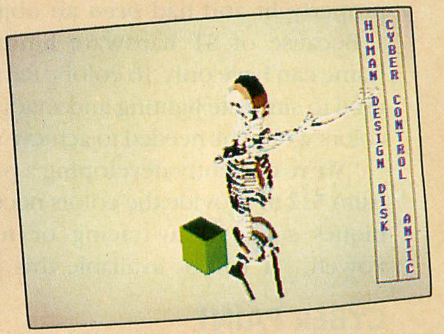
If you are an Atari-using artist or musician, you really should invest $49.95 in Virtuoso to experience the creative worlds it opens up. Like all rich artistic media, Virtuoso can be learned in a few hours, but it will take months to master the software's capabilities and years to fully explore its vast possibilities. *continued on page 44*

Desktop Video for the ST

Cyber software challenges $10,000 workstations

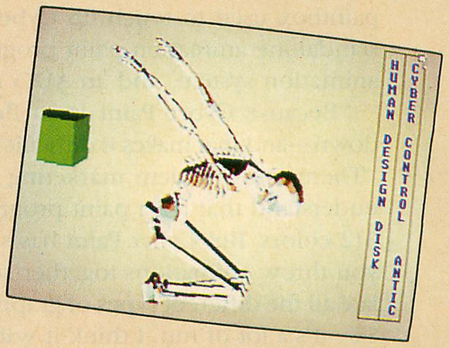
● *By* GREGG PEARLMAN, *Antic Assistant Editor*

"Desktop video" has come to Atari ST computers. **Cyber Studio** (featuring CAD-3D 2.0) and **Cyber Control** animate 3-D solid models which can be integrated into 2-D frame-by-frame animations with **Cyber Paint**. **Spectrum 512** gives you 512 colors to create high-quality *still* pictures. This is computer-generated graphics and animation at an advanced level which would otherwise require a dedicated graphics workstation costing at least $10,000.



"We're trying to put together a system that quickly and easily visualizes graphic ideas—particularly those ideas requiring movement," says Jack Powell, Antic Software's Manager of Product Development.

Most personal computers, including the Atari ST, can't provide the visual quality required for network television—at least 512 × 480 vertical and horizontal lines of resolution. (However, there is a Public Broadcasting station in San Jose, California that creates station breaks with an ST.) What the ST *can* do, because of the affordability of the computer and software, is allow companies to buy several stations for their employees, who in turn can do rough concept sketches quickly before polishing them on the expensive graphics workstations.

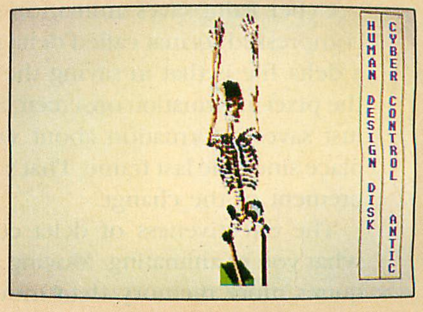


Interestingly, it's an *advantage* for desktop video that ST graphics aren't as detailed as those on the Amiga and the Macintosh. The more colors and resolution you have onscreen, the more memory that screen takes up. "If you're doing a screen-by-screen animation," says Powell, "not only does it take up more memory if each frame is larger—because of colors and so on—but all that raw data must be *moved*, so speed as well as memory are affected."

CYBER LINE-UP

The Cyber products work with both three-dimensional object-oriented images as well as two-dimensional raster images.

A raster image is a matrix of addressable 2-D points onscreen—in other words, screen memory. Painting software like DEGAS and Spectrum 512 produce raster images. The only way to change an image is to paint over it or use something like a cut-and-paste block move.



CAD systems such as CAD-3D and Easy Draw are object-oriented. Creating an object in such a system gives data information to the computer to the effect of, "The object starts at *this* XYZ location and moves, in a line, to *that* XYZ location." Since the objects are represented simply by numbers, they can be manipulated: you can change their size or zoom in almost infinitely, for example. *continued on next page*

Object-oriented data can be converted to other systems. You could create a space shuttle in CAD-3D, transfer its data to a professional graphics workstation system, such as an IBM PC or IRIS, and manipulate it there.

CYBER STUDIO

"Cyber Studio can be thought of as a 3-D solid-modeling toolbox to create your actors, objects and set," says Powell. The package consists basically of CAD-3D 2.0 and Cybermate, an advanced, Forth-based animation editing language essentially for programmers.

CAD-3D is unusual in that it's both raster and object-oriented. In Superview mode, when you render an object or image, you can paste it onto a raster background created with a paint program such as DEGAS or Cyber Paint. Then you can take the object and change the lighting and the drawing mode (wireframe, solid, etc.), then paste it again in another spot and keep on going. Cyber Studio has libraries of 3-D clip art available for CAD-3D.

"When you create animations using CAD-3D," says Powell, "the computer saves raster images of your objects a frame at a time. When you play it back, it looks like a dimensional object moving in real time because it's properly lit and had *been* an object in CAD-3D."

Because of ST hardware limitations, each rendered frame can have only 16 colors. Ranges of those colors are used to simulate lighting and shading of the objects. More colors would be needed to achieve more advanced effects.

"We're currently developing a program that uses Spectrum 512 to provide the colors needed for advanced techniques such as ray-tracing or texture-mapping," says Powell. "It will be available this year."

CYBER PAINT

Cyber Paint can be a number of things—an animation paintbox used to touch up Cyber Studio animations, a standalone animation paint program, a 2-D "cel" raster animation system, and an ADO motion effects system.

"Because Cyber Paint is so flexible, it's hard to pin down—and that makes it difficult to market," says Powell. "There's no problem marketing Spectrum 512. People understand that it's a paint program which lets you use 512 colors. But Cyber Paint has so many features. It lets you throw animations together so quickly and manipulate all the different types of graphics files available to the ST—it's a lot of fun. I think it will be one of our biggest hits once people understand what it is."

Cyber Paint saves animation sequences in a specially compressed format called delta files. The general idea of a delta file is that in saving the first frame, you save all the pixel information onscreen. Saving subsequent frames just saves information about what *changes* have taken place since the last frame. That's what "delta" is—a measurement of the change.

The effectiveness of delta compression depends on what you're animating. Moving large blocks of pixels requires more memory than moving small sections. The more visual *change* there is per frame, the more RAM is used.

Perhaps the most important feature of Cyber Paint is the ADO—Antic's Digital Omnimover, an ST adaptation of the Ampex Digital Optical Printing System. The ADO can move a 2-D image, either an animation or a clip, on a 3-D path through space, rotate it on the X, Y and Z axes, and make it appear to move closer or further away. And it can remap an animation to a 3-D image instead of just moving it.

Also, ADO allows infinite levels of image overlays and underlays, much like chroma key, a professional technique in which, for instance, the starship Enterprise would be filmed in front of a blue background and then laid over a background with stars or a planet.

CYBER CONTROL

Cyber Control is a very flexible scripting language that, among other things, allows highly sophisticated motion-control animation of 3-D object-based models created with Cyber Studio. These animations can be played back from the computer with ANIMATE3.PRG, a public domain autoplayer, touched up in Cyber Paint, or sent to video.

"Tom Hudson tried to make the Cyber Control language as simple as possible without sacrificing power," says Powell. "It's modeled after BASIC, which many people know. And even if you don't know BASIC, you could learn to use Cyber Control for simple animations."

"You can also create objects with it that you can't with CAD-3D alone. And only Cyber Control lets you create animations with flexible 3-D objects. Darrel Anderson used Cyber Control to create a demo featuring flexible membranes—an extremely advanced computer graphics technique."

In Cyber Control (which requires Cyber Studio) you can set a few points and tell the system that you want a curve which follows those points. This curve would be a *spline*—a path that smoothly follows set points. You can set three types of splines—smooth curves that go through the points, straight lines that go from point to point, or lines that gravitate toward the points without passing through them. Once your points are set, you can have an object—or the cameras or light sources—follow those points. Or you can have the program create an object using those points as the object's shape.

SPECTRUM 512

Spectrum 512 is a paint program for making high-quality still pictures. It's not designed for animation. But the latest slideshow program for Spectrum 512 lets you set up batch files for page-flipping animations (about 12 frames on a 1Mb ST and 80 on a Mega 4) as well as creating stereo pictures for the Stereotek glasses available from the Catalog.

(This program, SPSLIDE8.PRG is part of the file SPSLD8.ARC and can be found in download library 1 of the Atari Developers SIG on CompuServe. Only two programs can be kept in the Cyber Connection area of ANTIC ONLINE, so when new programs become avail-

able, the previous ones are moved to the SIG.—ANTIC ED)

"Essentially, Spectrum 512 is the best painting software for this computer," says Powell. "The anti-aliasing and dithering functions in Spectrum 512 can make an image look almost photographic. Anti-aliasing is a process that, in effect, 'averages' adjacent colors, softening the border between them. You really need many colors to do this. Professional computer graphics people will tell you that if they must make a choice between many colors and more detailed resolution, they'd prefer the colors. You can create illusions with color that you can't create with higher resolution."

Spectrum 512 generates a solid 512 colors which can be placed almost anywhere onscreen. Up to 48 colors can be placed on any scan line, and the program automatically does a "best fit" on any color over 48. This allows the software to closely simulate "truecolor" effects similar to what the AT&T Targa board can do on the IBM PC or the Mac II.

Spectrum 512 also uses dithering to simulate as many as 24,389 colors. Dithering is a technique where a pattern of pixels is used to create the illusion of another, unavailable color. "Let's say you have only the colors red and yellow in your paintbox and you create a checkerboard using those colors," Powell says. "You make a color that looks, from a distance, like orange. Spectrum 512 uses this idea with different percentages; for example, 25% red and 75% yellow produces a yellowish orange. If it's the reverse, it'd be a reddish orange. Spectrum 512 primarily uses this technique for photodigitizing—to convert Amiga .IFF files and CompuServe GIF files (created with a Macintosh II, for example) to the Spectrum 512 format. DigiSpec, a $39.95 program from Trio Engineering, creates 24,389-shade pictures on the Atari with Computereyes. (See *ST New Products* in this issue.)

"Even though the ST's low resolution is only 320×200 pixels, it's important for people to realize that not only does dithering increase the colors, but that effective anti-aliasing is really only possible with a lot of colors."

VIDEO

At this writing, if you bought nothing but Atari hardware and Antic software, you could get true video output only from a 520ST which has RF television output and was upgraded to at least 1Mb to work with the Cyber software.

The big problem, according to Powell, is that the Atari ST is not designed for NTSC (National Television Standards Committee) video output. But Practical Solutions makes a converter box for the ST that changes RGB analog output to NTSC composite video output. You'd need either this converter or the built-in composite output which 520STFMs have.

"The most important thing for video output in terms of our software is the upcoming Genlock unit from JRI," says Powell. "This will let you combine computer-generated images with true video from a television, VCR, or videocamera.

"The product that will tie all this together is **Cyber VCR**, Tom Hudson's newest program, which lets you set up a script—a list of all the animations in your library that you want to run. You can decide what order to run them in, repeat animations more than once, choose the number of frames you want to run from an animation, run it backwards or forwards at variable speeds and so on. You can choose the splices you want—fades, cuts, etc. And you can design fancy custom wipes in Cyber Paint."

Cyber VCR works with any Sony Beta or 8mm VCR that has a special "Remote" jack (5-pin micro DIN style). The program will read files off the computer and automatically control the VCR's recording of the various animations via an included custom cable designed by Mark Kimball and Antic's Director of Product Development, Gary Yost. The final output is completely free of editing glitches, due to Sony's foresight in designing flying erase heads for these VCRs.

Recently Antic alpha-tested Supra's real-time SupraView digitizer which captures images at up to 24 frames per second *as they move*. SupraView will be compatible with Cyber Paint. It should be released early in 1988 and will probably cost around $199.

The current SupraView digitizing software is "adequate," according to programmer Mark White, head of technical support at Supra Corp. But Supra is working on improved software which will be available as an upgrade for registered owners. Supra Corp. is also working on a way to digitize pictures for Spectrum 512 using red, green and blue filters.

CYBER FUTURE

CAD-3D 2.0 has two modelers—a spin-tool which is like a lathe and an extruder which is like a jigsaw. Hudson's new **Cyber Sculpt** (available this spring) will provide all the modeling tools you'd find on an advanced 3-D graphics workstation. You can grab a vertex on a model you've made and drag it, twist it, push it, punch it, or slice it. "You'll have full flexibility to create very natural shapes for CAD-3D," says Powell. "This program will be a desk accessory like Cyber Control, only mouse-controlled and very easy to use."

Antic Software will also bring out more design disks with advanced Cyber Control clip-art for 3-D character animation and video titling, and an upcoming program will let you map pictures onto 3-D objects—in other words, you'll be able to put *raster* images onto *objects*—to create, for example, moebius strips or realistic water.■

SPECTRUM 512—$69.95, ST0249 (color)

CYBER STUDIO—$89.85, ST0326 (1Mb)

CYBER CONTROL—$59.95, ST0250 (1Mb, Cyber Studio)

CYBER PAINT—$69.95, ST0251 (color, 1Mb)

Antic Software, The Catalog, 544 Second Street, San Francisco, CA 94107. (800) 234-7001.

THE STORY BEHIND VIRTUOSO
continued from page 38

Lyons acknowledges that the company has had some trouble establishing Desktop Performance Studio in the distribution/retail pipeline. "We've been distributing the software kind of by hand. But through users groups and online we've had people sending us retailer lists in the various states. The retailers are very interested in the product, but they have no way to get it."

INSTANT RESULTS

Schwartz says that the main thing he and Lyons want to provide for 8-bit computers is something *instant*—where you don't need to wait for results, spending an hour composing a frame and then going to the next frame and trying to manipulate it. "You need a very strong imagination when doing frame-by-frame animation," he says, "which basically amounts to a form of expertise. We wanted to *minimize* user expertise requirements—addressing those people who never thought they had any musical or artistic skills and showing them that they *can* create pieces."

Schwartz adds, "Compact discs hold gigabytes of information, so we realized that to achieve any controlled representation of sound that was anything close to real time, we had to get the numbers down. You can't expect to manipulate 80K in one second and be very flexible, even on a 16mHz computer. So we came up with a whole new set of theories about how sound is broken down. We realized that the difference between sound and light was only a matter of frequency, so we knew we could apply the same theories to graphics and animation."

The basic concept is of Virtuoso is to avoid anything 'static,' explains Schwartz. "CDs and similar media basically do page-flipping through tens of thousands of static frames each second. You get the illusion of motion, just like a motion picture. We decided to deal with representations based on *dynamic* principles, where the numbers are related to dynamic changes in the sound or the visual. By developing this system, we began achieving enormously efficient representations of moving objects, both sound and visual." ■

DESKTOP VIDEO FOR ATARI XL/XE
continued from page 40

DESKTOP PERFORMANCE STUDIO
Virtuoso Software
Virtusonics Corp.
123 Duke Ellington Blvd.
New York, NY 10025
(212) 316-6945
$49.95, 64K disk (XL/XE only)
CIRCLE **289** ON READER SERVICE CARD ■

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*Longtime **Antic** contributor Charles Cherry squeezed in this important review while writing rush documentation for the OSS-designed ADOS operating system which will be shipped with Atari's new double-capacity, triple-fast XF551 disk drive.*

ST Games Gallery

Test Drive, Superbike Challenge

TEST DRIVE

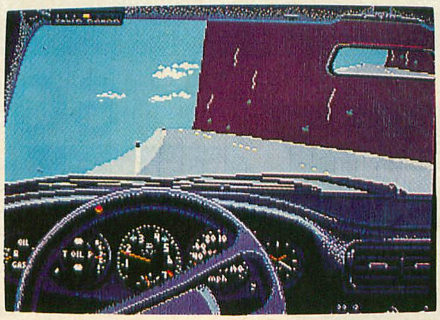
Accolade's two-disk **Test Drive** just might be the hottest arcade auto-driving simulator yet. You take the wheel of one of the costliest exotic cars on the road today—Chevy Corvette, Ferrari Testarossa, Lamborghini Countach, Porsche 911, or Lotus Turbo Esprit. Try to beat the clock on a twisting road modeled after California's Highway 1, while you avoid oncoming traffic and the police.

Your driver's seat environment has a steering wheel, dashboard, stick shift, radar detector and a functioning rearview mirror. The joystick controls steering, shifting, acceleration and braking. Joystick left/right steers the car rather well, although each increment of the joystick has an increased turn rate. Moving the stick up or down while not pressing the button will cause the car to speed up or brake. Moving the stick with the button down is one way to shift the gears.

Manual shifting can be difficult because the joystick's pattern is an asterisk—which does not match many automotive stick shift patterns. So much concentration is needed that you forget to watch where you're going and end up falling off a cliff. An easier option is a sort of semi-automatic shift. Moving the joystick up or down with the button held down will shift gears.

Passing cars is easy. Just pop over to the opposite lane, floor the gas and zip back while avoiding any oncoming traffic. There always seems to be some traffic when you pass a car, especially on a curve. Try accelerating into a gear's redline and you will blow the clutch. Turning hard into a curve will cause a skid.

Your main goal is to race up a hill at incredible speed while avoiding the one person who does not allow for



this kind of behavior. Your car is equipped with a radar detector—watch it. When that baby starts to beep and flash, it means there's a smokey on your tail.

If you get caught, you are forced to decelerate and pull over, sit and wait until a ticket appears on the screen. At that point you may continue up the hill, but your completion time will be pretty bad.

As soon as your radar detector starts, check the rearview mirror. A police car should be advancing and now is the time for you to go ballistic. Accelerate through every gear until it redlines and then shift to the next gear. This works best if you are in third gear when the radar detector goes off. If you accelerate quickly enough the police car will drift away.

Test Drive is great entertainment software. I recommend it to anyone with the need for speed.—SCOT TUMLIN

$49.95, color and joystick. Accolade, 20813 Stevens Creek Boulevard, Cupertino, CA 95014. (408) 446-5757.

CIRCLE **290** ON READER SERVICE CARD

SUPERBIKE CHALLENGE

Lately I find myself scanning the ESPN listings for motorcycle races, shopping sporting goods stores for racing slicks and visiting motorcycle shops to admire the two-wheeled terrors. And it's all the fault of Broderbund's **Superbike Challenge**, the best motorcycle simulation I've ever played, not to mention the finest program I've ever seen at a budget price of $19.95.

The perspective of the game is from about 10 feet behind your motorcyle. The program provides 12 courses modeled after real European layouts, right down to background scenery. Race all 12 for the world championship—at novice, intermediate and expert levels. You can compete against five other computer-controlled bikes or against a human foe plus four bikes run by the computer. Each bike can be controlled by keyboard or joystick, although the stick is highly recommended.

It will likely be several races, even at the novice level, before you can consistently stay out of last place. I can give you a few tips on getting to the championship—at least at novice level. Memorize as much of the course as possible. Try to set up each turn. When a right curve is coming up, stay to the left side of the track and dive into the turn just as soon as it appears on the screen. Don't stay in the turn too long. About halfway through, get the bike straightened up and ready for the next one. In almost every five-lap race, there'll be some accidents. Practice getting back to top speed as quickly as possible from a standing start; it will be vital to finishing first.

Overall, this is one of the most entertaining and exciting racing games of any kind for the ST.—RICK TEVERBAUGH

$19.95, color only. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. (415) 492-3200.

CIRCLE **284** ON READER SERVICE CARD ■

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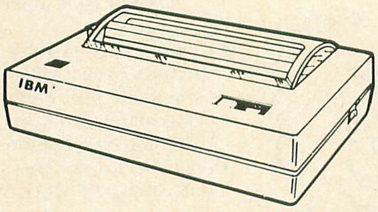
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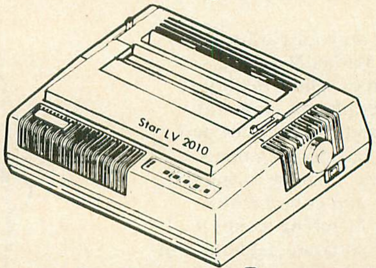
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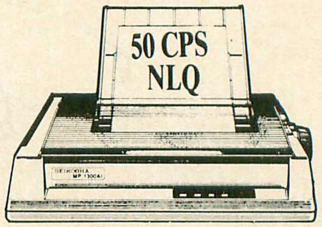
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CIRCLE 037 ON READER SERVICE CARD

Type-In Software

BASIC Concentration

Flashy GFA quiz challenge

By PAUL PRATT *And* STEPHEN EVERMAN

You don't need Hugh Downs to help you play Concentration, a speedy GFA BASIC version of the well-known television game. BASIC Concentration is written by the authors of *Deduction* (**Antic**, December 1986), *Super Trek* (January 1987), *Antic Towers* (May 1987) and *Maze* (March 1988).

Concentration runs only in medium resolution, so a color monitor is required. When you start the game, you'll be asked to choose either the one-player or two-player version. Then eight rows of eight dots apiece will be drawn on the screen.

Click on two of the dots. This turns up two icons—for example, a butterfly and a disk. Well, your icons don't match, so the next player gets a chance and turns up two briefcases. Whoa! A match! The briefcase icon appears in your opponent's column, while a letter or space appears where those dots were.

If your opponent can guess the famous saying hidden by the dots, the game is over and you lose. If not, it's your turn again. This continues until one of you guesses the saying.

To make a guess, just click where the screen says you should click, and then type your guess (which the program will automatically put in all capital letters). If nobody guesses correctly, nobody wins—but this only happens when all icons are removed from the board without a correct guess. If you're playing the one-person version, you'll just keep clicking and guessing until you either win or lose, as above.

It's easy to add your own sayings to the puzzle. The sayings are stored in Data statements at the bottom of the program. Use these lines as a guide for creating and adding your own Data statements. Remember, though, that you cannot use any commas in your Data statements.

In this example, we'll add the famous saying, "BUY ANTIC MAGAZINE". When written into a Data statement in GFA BASIC, the saying looks like this:

```
Data BUY ANTIC MAGAZINE
```

All you need to do is add this sample statement to the other Data statements at the bottom of the program. Of course, you must remember to Save your new version of the program before you Run it. *Listing on page 66*

ST Applications

Chemistry and Printing ware

Reviewed By JIM PIERSON-PERRY

LEWIS123

One of the first pure-science applications for the ST, **Lewis123** (Version 3.0) is billed as a spreadsheet for chemistry. This is misleading because the program bears no resemblance to Lotus 1-2-3 of spreadsheet fame. Instead it is a sketchpad for drawing two-dimensional molecular structures built according to the Lewis theory of covalent bonding (familiar to any trained chemist).

Drawing molecular structures is straightforward. Up to 460 chemical elements per structure can be selected from menus, dragged to desired locations and have bonds (lines) drawn between them by clicking. Only covalent bonds are supported. Elements that preferentially bond by other means (transition metals and rare earths) are not included in the selection menus.

Warnings are given for bonds that would violate the Lewis theory. An option is available to ionize elements in order to give (or force) bonds in agreement with theory. Once a bond is formed between two elements, it is maintained no matter how the elements are subsequently moved.

The position of bonds between two elements is determined solely by program logic and can lead to structure diagrams that are chemically valid but aesthetically poor. The manual suggests trial and error to remove and recreate bonds to improve the plot quality. A snap grid template can be used to aid in positioning elements.

You can cut and paste variable-sized blocks of a structure, either an entire molecule or a piece of it. These blocks can be used to speed drawing structures with repeating units or stored on disk as a library of building blocks. Block rotation is not supported and is sorely missed.

Lewis123 is not copy-protected. It requires a monochrome monitor. A printer is optional to provide hardcopy of the structures. An Epson printer driver is supplied (DEGAS .PI3 format). Users with other models must provide their own DEGAS printer drivers.

The accompanying manual does a good job of covering program function, but desperately needs proofreading. A slide-show program is included.

Besides drawing, Lewis123 can analyze formal charge, determine the theoretical bond requirement for a given set of elements, and provide reference data on individual elements. While of some theoretical interest, these options are not well implemented. The theoretical bond calculation applies only to all unbonded elements on the screen and gives meaningless results when used to verify a structure. The element count screen shows all available elements, whether used or not. A simple molecular formula and molecular weight would be far more useful and less cluttered.When everything works, Lewis123 can generate good-quality molecular structure diagrams. Users who want to just draw structures should test the program first. A demo version is widely available on bulletin boards. Given the amount of work needed to draw a structure and the monochrome restriction, you may well opt to just use a more powerful drawing program like DEGAS in the first place.

$29.95, monochrome only. Stone Age Software, P. O. Box 1216, Amherst, NH 03031. (603) 881-7689.

CIRCLE **286** ON READER SERVICE CARD

FONTS & BORDERS

Fonts & Borders is the latest addition to the growing PrintMaster Plus design library. With 3 collections of clip-art graphics now available (Art Gallery I, II, III), this newcomer addresses another printing need—additional text fonts and border styles. Fifteen new fonts and 20 new border designs are provided, with 3 of the fonts in multiple sizes.

The fonts are all attractive and cover a wide range of styles from elegant to backwoods. The border designs are equally impressive. Some seem destined for fame, such as the dinosaur and Halloween borders. Whatever the occasion, you are guaranteed to find appropriate designs.

A patch program also is included to automatically upgrade the original PrintMaster program to the current PrintMaster Plus. Since I bought my copy just before the new version came out, I really appreciate this bonus. The upgrade only takes a couple of minutes and then you are ready to go. You must have the upgraded program in order to make use of these additional fonts and borders. The program also comes with a catalog of related products including colored paper, heat transfer ribbons (to create customized T-shirts) and a manual of applied graphic design.

I am very pleased with the quality and number of additional fonts and borders provided in this package.

Unison World has an excellent program in PrintMaster Plus and continues to support and extend its applications with these additional library collections.

$29.95, color or monochrome. Unison World, P.O. Box 3056, Berkeley, CA 94703. (415) 848-6666.

CIRCLE **287** ON READER SERVICE CARD

■

ST New Products

By GREGG PEARLMAN, *Antic Assistant Editor*

DIGISPEC & UNISPEC

Digispec works with your Computereyes digitizer to capture 512-color images from a video camera or VCR. Then it displays the image on your color monitor and lets you adjust the color balance, brightness and contrast before you save it to disk in Spectrum 512 format. On top of 512 *pure* colors, Digispec's dithering capabilities bring the number of *simulated* colors to 24,389. And the program is compatible with Amiga .IFF files and CompuServe GIF files. You can view *any* Amiga picture, even a 4,096-color Hold-and-Modify mode picture, and convert it to Spectrum 512 format, then touch it up *in* Spectrum 512.

Unispec turns Spectrum 512 (see review in this issue) into a desk accessory that can run simultaneously with any regular GEM program, most notably DEGAS Elite and CAD-3D. You can instantly import full-screen pictures or blocks generated by the other program to Unispec's 512-color screen or to the buffer, and blocks from the outside program can be pasted on top of the current 512-color picture. You can also touch up images digitized with Digispec and Computereyes in Unispec.

Unispec features anti-aliased lasso cut-and-paste, which lets you cut an arbitrary curved shape from one picture and paste it to another without any "jaggies."

$39.95 each, color. Trio Engineering, P.O. Box 332, Swampscott, MA 01907. (617) 964-1673. FINAL.
CIRCLE **159** ON READER SERVICE CARD

DRAW, STUD

For **Home Casino Poker Etc**, Dubl Dubl Funware has added Blackjack to its already popular Draw and Stud Poker package. A color monitor is required for these lightning-fast card games. Draw Poker features the best elements of poker machines. Stud Poker is a head-to-head game, played against other people or the computer. Blackjack is played just as it is in the casinos. All games are for one to four players.

$34.95. Dubl Dubl Funware, P.O. Box 06401, Portland, OR 97206. (503) 771-7833. PRESS.
CIRCLE **165** ON READER SERVICE CARD

WILD BLUE YONDER

MicroProse's **Gunship** ($49.95) is a simulation of the U.S. Army's AH 64A Apache attack helicopter. All new Army pilots must train at the Gunship base before reporting to hazardous combat duty in Southeast Asia, Central America, the Middle East and Western Europe. Gunship generates the topography, enemy weaponry and strategy present in each region. You control not only the aircraft but its weapons and counter-measures as well. The enemy's artificial intelligence responds with the weapons and tactics most likely to defeat you.

F-15 Strike Eagle ($39.95) is enhanced for its ST version—with higher resolution, more detail and color and additional game play features. You're the pilot of an F-15 all-weather, air-superiority and ground attack fighter with more than 24 flight weapons and electronic counter-measure controls. Mission scenarios range from Southeast Asia to the Persian Gulf, and a new mission has been added to recreate the United States' 1986 retaliatory strike against Libya.

MicroProse, 120 Lakefront Drive, Hunt Valley, MD 21030 (301) 771-1151. Both items PRESS.
CIRCLE **160** ON READER SERVICE CARD

NEW REAL BASIC

Real BASIC, version 1.3, is compatible with all previous versions of Real BASIC as well as ST BASIC. It's GEM-based, making frequently-used commands such as LIST and LOAD available via a menu bar, and features a series of new keywords and functions as well as dialog boxes and alerts. The extended directory commands let you list subdirectories, access files within folders and change the default directory and drive. Most GEM tasks can now be performed with a single BASIC statement instead of PEEKs and POKEs, and a MIDI statement has been added so you can use the MIDI ports. Updates to registered Real BASIC users are free.

$49.95. Computer Crossware Labs, Inc., 516 Fifth Avenue, Suite 507, New York, NY 10036. (212) 644-2591. FINAL.
CIRCLE **164** ON READER SERVICE CARD

VROOM

In the joystick-controlled **Speed Buggy**, a longtime arcade favorite, you jump your buggy over obstacles, drive on two wheels and run into flags to gain time and bonus points. Be a maniac—you deserve it.

$44.95. Data East U.S.A, 470 Needles Drive, San Jose, CA 95112. (408) 286-7074. PRESS.
CIRCLE **161** ON READER SERVICE CARD

ELECTION '88

SSI's **President Elect—1988 Edition** says that Vice President Bush had better hope for no recession of any kind, or else he doesn't have a prayer against the likes of Cuomo, Dukakis, Gephardt and Gore. However, before the stock market crash in October, 1987, President Elect forecasted a decisive victory for Bush. No predictions were made for Gary Hart.

President Elect lets you simulate any election from 1988 back to 1960 using any actual figures from a large roster of actual historical or present-day canddates. You can rate existing candidates or create fictional ones by using a built-in political "litmus test" that measures potential candidates' political orientation in economics, domestic and foreign policy areas. On election night, votes are tallied and states are projected minute by minute until a candidate gets the required 270 electoral votes.

$24.95. Strategic Simulations, Inc., 1046 Rengstorff Avenue, Mountain View, CA 94043. (415) 964-1353. FINAL.
CIRCLE **163** ON READER SERVICE CARD

New ST product notices are compiled from information provided by the products' manufacturers. ***Antic*** *assumes no responsibility for the accuracy of these notices or the performance of the product. Each mention is followed by a code word indicating that, at press time,* ***Antic*** *had seen a FINAL marketable version, near-final BETA, earlier ALPHA, incomplete DEMO, or PRESS release.*

SOFTWARE LIBRARY

DISK SUBSCRIBERS: Programs for 8-bit Atari computers can be used immediately. Just follow instructions in the accompanying magazine articles. ST Owners: See monthly disk's ST Help File for instructions on how to transfer programs to 3-1/2 inch disk.

DOS COMPATIBILITY: All 8-bit programs published by **Antic** are tested to work with Atari Disk Operating System (DOS) 2.0S and 2.5—*not* with the incompatible DOS 3.0. DOS 2.0S is available on each Antic Monthly Disk. Copy the DOS.SYS and DUP.SYS files.

TYPING SPECIAL ATARI CHARACTERS

Antic printed program listings leave a small space between each Atari Special Character for easier reading. Immediately below you will see the way **Antic** prints all the standard Atari letters and numbers, in upper and lower case, in normal and inverse video.

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
0123456789 0123456789

The Atari Special Characters and the keys you must type in order to get them are shown in the two boxes below.

NORMAL VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL S
	CTRL A		CTRL T
	CTRL B		CTRL U
	CTRL C		CTRL V
	CTRL D		CTRL W
	CTRL E		CTRL X
	CTRL F		CTRL Y
	CTRL G		CTRL Z
	CTRL H		ESC ESC
	CTRL I		ESC CTRL −
	CTRL J		ESC CTRL =
	CTRL K		ESC CTRL +
	CTRL L		ESC CTRL *
	CTRL M		CTRL .
	CTRL N		CTRL ;
	CTRL O		SHIFT =
	CTRL P		ESC SHIFT CLEAR
	CTRL Q		ESC DELETE
	CTRL R		ESC TAB

INVERSE VIDEO

FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL X
	CTRL A		CTRL Y
	CTRL B		CTRL Z
	CTRL C		ESC SHIFT DELETE
	CTRL D		ESC SHIFT INSERT
	CTRL E		ESC CTRL TAB
	CTRL F		ESC SHIFT TAB
	CTRL G		CTRL .
	CTRL H		CTRL ;
	CTRL I		SHIFT =
	CTRL J		ESC CTRL 2
	CTRL K		ESC CTRL DELETE
	CTRL L		ESC CTRL INSERT
	CTRL M		
	CTRL N		
	CTRL O		
	CTRL P		
	CTRL Q		
	CTRL R		
	CTRL S		
	CTRL T		
	CTRL U		
	CTRL V		
	CTRL W		

Whenever the CONTROL key (CTRL on the 400/800) or SHIFT key is used, *hold it down* while you press the next key. Whenever the ESC key is pressed, *release* it before you type the next key.

Turn on inverse video by pressing the Reverse Video Mode Key . Turn it off by pressing it a second time. (On the 400/800, use the Atari Logo Key instead.)

Among the most common program typing mistakes are switching certain capital letters with their lower-case counterparts—you need to look especially carefully at P, X, O and 0 (zero).

Some of Atari Special Characters are not easy to tell apart from standard alpha-numeric characters. Usually the Special Characters will be boxed. Compare the two sets of characters below:

SPECIAL		STANDARD	
	CTRL F	/	/
	CTRL G	\	SHIFT +
	CTRL N	_	SHIFT −
	CTRL R	−	−
	CTRL S	+	+

HOW TO USE TYPO II (8-BIT)

TYPO II automatically proofreads **Antic**'s type-in BASIC listings for 8-bit Atari computers. It finds the exact line where you made a program typing mistake.

Type in TYPO II and SAVE a copy to disk or cassette. Now type GOTO 32000. When you see the instruction on the screen, type in a single program line **without the two-letter TYPO II code** at the left of the line number. Press the [RETURN] key.

Your line will reappear at the bottom of the screen with a two-letter TYPO II code on the left. If this code is not exactly the same as the line code printed in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [*] followed (without in-between spaces) by the line number, then press [RETURN]. When the complete line appears at the top of the screen, press [RETURN] again. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 [RETURN] (Cassette owners LIST "C:). Type NEW, then ENTER "D:FILENAME"[RETURN](Cassette—ENTER "C:). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

Don't type the TYPO II Codes!

```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
   SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "↖":POSITION 11,1:? "TYPO II "
EM 32050 TRAP 32040:POSITION 2,3:? "Type
   in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
   $:IF LINE$="" THEN POSITION 2,4:LIST B
   :GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
   E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
   GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
ET 32120 ? "↖":POSITION 11,1:? " TYPO II 
   ":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINE$:IF
   LINE$="" THEN ? "LINE ";B;" DELETED":G
   OTO 32050
VV 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
   ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$
   (LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
   t match press  RETURN  and edit line a
   bove.":GOTO 32050
```

escape from the "simplified" tax maze

1040 TERMINATOR

Article on page 24

LISTING 1

Don't type the TYPO II Codes!

```
RU 2 REM 1040 TERMINATOR
HD 4 REM BY STEPHEN STOUT
QU 6 REM (c)1988, ANTIC PUBLISHING
MP 10 GOTO 1750
SZ 20 POKE 77,0:ST=STICK(0):IX=(ST=7)-(ST
   =11):IY=(ST=13)-(ST=14):IF IX=0 AND IY
   =0 THEN 190
EP 30 LOCATE X+IX,Y+IY,Z
WY 40 IF Z<>32 AND Z<>133 AND Z<>136 AND
   Z<>38 THEN 190
VP 50 IF Z=133 THEN SOUND 0,150,12,15
JI 60 IF Z=38 THEN SOUND 0,50,10,15:DOTS=
   DOTS-1
CL 70 POSITION X,Y:? #6;" ":X=X+IX:Y=Y+IY
   :POSITION X,Y:? #6;"◪"
LA 80 IF Z<>133 THEN 170
YA 90 IF IY<>0 THEN 130
NL 100 D=Y-1:LOCATE X,Y+1,Z:IF Z=132 THEN
    D=Y+1:POSITION X,D+1:? #6;" ":GOTO 12
   0
JQ 110 POSITION X,D-1:? #6;" "
TR 120 POSITION X-1,D:? #6;"▯▯▯":GOTO 160
EP 130 D=X-1:LOCATE X+1,Y,Z:IF Z=132 THEN
    D=X+1:POSITION D+1,Y:? #6;" ":GOTO 15
   0
PA 140 POSITION D-1,Y:? #6;" "
CX 150 POSITION D,Y-1:? #6;"▯":POSITION D
   ,Y+1:? #6;"▯"
RT 160 SOUND 0,0,0,0:GOTO 190
PS 170 SOUND 0,0,0,0:IF Z=8 THEN 350
IW 180 IF DOTS=0 THEN 470
BB 190 LOCATE X1+IX1,Y1+IY1,Z:IF Z=7 OR Z
   =32 OR Z=38 THEN 290
PC 200 IF IX1=0 THEN 250
VK 210 IY1=INT(RND(0)*2):IF IY1=0 THEN IY
   1=-1
SP 220 LOCATE X1,Y1+IY1,Z:IF Z<>32 AND Z<
   >7 AND Z<>38 THEN IY1=-IY1
KB 230 LOCATE X1,Y1+IY1,Z:IF Z<>32 AND Z<
   >7 AND Z<>38 THEN IY1=0:IX1=-IX1:GOTO
   330
CK 240 IX1=0:GOTO 290
SZ 250 IX1=INT(RND(0)*2):IF IX1=0 THEN IX
   1=-1
MI 260 LOCATE X1+IX1,Y1,Z:IF Z<>32 AND Z<
   >7 AND Z<>38 THEN IX1=-IX1
AJ 270 LOCATE X1+IX1,Y1,Z:IF Z<>32 AND Z<
   >7 AND Z<>38 THEN IX1=0:IY1=-IY1:GOTO
   290
CY 280 IY1=0:GOTO 290
EM 290 LOCATE X1,Y1,Z2:IF Z2=133 THEN Z1=
   Z2
CF 300 POSITION X1,Y1:? #6;CHR$(Z1)
YS 310 X1=X1+IX1:Y1=Y1+IY1:LOCATE X1,Y1,Z
   1:POSITION X1,Y1:? #6;"◩"
```

continued on next page

```
IX 320 SOUND 0,0,12,15:SOUND 0,0,0,0
EK 330 IF Z=7 THEN 350
PW 340 GOTO 20
XH 350 LIVES=LIVES-1:POSITION 18,0:? #6;L
   IVES
NZ 360 FOR I=15 TO 0 STEP -1:SOUND 0,0,0,
   I:SOUND 1,0,0,0
XX 370 POSITION X,Y:? #6;"◙":FOR D=1 TO 1
   5:NEXT D:SOUND 1,200,12,I
YY 380 POSITION X,Y:? #6;"◪":FOR D=1 TO 1
   5:NEXT D:NEXT I:SOUND 0,0,0,0:SOUND 1,
   0,0,0
HV 390 IF Z1=7 THEN Z1=32
IG 400 IF Z2=7 THEN Z2=32
KW 410 IF LIVES=0 THEN 430
LY 420 X=OX:Y=OY:POSITION X,Y:? #6;"◙":GO
   TO 20
SP 430 POSITION 0,1:? #6;"you lose hit tr
   igger"
PP 440 FOR I=10 TO 250 STEP 2:SOUND 0,I,1
   0,10:NEXT I:SOUND 0,0,0,0
OQ 450 POKE 77,0:IF STRIG(0)=1 THEN 450
VA 460 RUN
MH 470 FOR D=1 TO 250:NEXT D
QO 480 IF SCREEN=5 THEN 510
SC 490 SCREEN=SCREEN+1
OQ 500 GOTO 540
CQ 510 POSITION 0,1:? #6;"you win⊞ hit tr
   igger"
RT 520 FOR I=250 TO 10 STEP -2:SOUND 0,I,
   10,10:NEXT I:SOUND 0,0,0,0
OX 530 GOTO 450
YG 540 POKE 559,0:POSITION 0,0:? #6;"◙"
FE 550 POSITION 0,0:? #6;" SCREEN:";SCREE
   N;"    LIVES:";LIVES
EW 560 FOR I=2 TO 22:READ SC$:POSITION 0,
   I:? #6;SC$:NEXT I
WT 570 READ OX,OY:X=OX:Y=OY:POSITION X,Y:
   ? #6;"◙":READ DOTS
DY 580 READ X1,Y1,IX1,IY1:LOCATE X1,Y1,Z1
   :POSITION X1,Y1:? #6;"◩"
XE 590 POKE 559,34:GOTO 20
VA 600 DATA ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞
OP 610 DATA ⊞&&&&& &&&&&& &&&&&⊞
JE 620 DATA ⊞&⊞⊞⊞◙◙⊞⊞⊞⊞⊞◙◙⊞⊞⊞&⊞
BG 630 DATA ⊞&◙&&& &&&&&& &&&◙&⊞
XV 640 DATA ⊞ ◙ ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞ ◙ ⊞
LB 650 DATA ⊞&◙&⊞&&&&&& &&&◙&⊞
QM 660 DATA ⊞&⊞&◙&⊞⊞⊞⊞◙◙⊞&◙&⊞&⊞
XF 670 DATA ⊞&⊞ ◙ ⊞&&&& &⊞ ◙ ⊞&⊞
GQ 680 DATA ⊞&⊞&◙&⊞⊞⊞⊞&⊞&◙&⊞&⊞
ZS 690 DATA ⊞&⊞&⊞&⊞⊞⊞⊞&⊞&⊞&⊞&⊞
UQ 700 DATA ⊞&⊞&⊞&⊞&    ⊞⊞&⊞&⊞&⊞
ZD 710 DATA ⊞&⊞&⊞&⊞&⊞⊞⊞⊞&⊞&⊞&⊞&⊞
GF 720 DATA ⊞&⊞&◙&⊞&⊞⊞⊞⊞&⊞&◙&⊞&⊞
XQ 730 DATA ⊞&⊞ ◙ ⊞& &&&&⊞ ◙ ⊞&⊞
AW 740 DATA ⊞&⊞&◙◙◙⊞⊞⊞⊞⊞◙◙◙⊞&⊞
LU 750 DATA ⊞&◙&⊞&&& &&&&&⊞&◙&⊞
YA 760 DATA ⊞ ◙ ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞ ◙ ⊞
BP 770 DATA ⊞&◙&&& &&&&&& &&&◙&⊞
JR 780 DATA ⊞&⊞⊞⊞◙◙⊞⊞⊞⊞⊞◙◙⊞⊞⊞&⊞
PG 790 DATA ⊞&&&&& &&&&&& &&&&&⊞
VC 800 DATA ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞
UF 810 DATA 9,12,156
EI 820 DATA 3,5,0,1
VI 830 DATA ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞
XX 840 DATA ⊞&&&&&&&&&&&&&&&&&&⊞
RB 850 DATA ⊞&⊞⊞⊞⊞⊞⊞⊞⊞⊞&⊞&⊞⊞⊞⊞⊞⊞
AL 860 DATA ⊞&&&&&&&&&&&◙&&&&&&⊞
DC 870 DATA ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞ ◙ ⊞⊞⊞⊞&⊞
AP 880 DATA ⊞&&&&&&&&&&◙&&&&&&⊞
TN 890 DATA ⊞&⊞⊞⊞&⊞⊞⊞⊞&⊞&⊞⊞⊞⊞⊞⊞
EC 900 DATA ⊞&&&&&◙&&&&&&&&&&&&⊞
SH 910 DATA ⊞⊞⊞⊞⊞ ◙ ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞&⊞
EG 920 DATA ⊞⊞&&&&◙&&&&&&&&&&&&⊞
TC 930 DATA ⊞&⊞⊞⊞&⊞&⊞⊞⊞&⊞&⊞⊞⊞⊞⊞⊞
AI 940 DATA ⊞&&&&&&&&&&&◙&&&&&&⊞
CZ 950 DATA ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞ ◙ ⊞⊞⊞⊞&⊞
AM 960 DATA ⊞&&&&&&&&&&◙&&&&&&⊞
TK 970 DATA ⊞&⊞⊞⊞&⊞⊞⊞⊞&⊞&⊞⊞⊞⊞⊞⊞
ES 980 DATA ⊞&&&&&◙&&&&&&&&&&&&⊞
SX 990 DATA ⊞⊞⊞⊞⊞ ◙ ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞&⊞
OZ 1000 DATA ⊞&&&&&◙&&&&&&&&&&&&⊞
GQ 1010 DATA ⊞⊞ ⊞⊞&⊞&⊞⊞⊞⊞⊞⊞⊞⊞&⊞
RF 1020 DATA ⊞⊞ ⊞⊞&&&&&&&&&&&&&&⊞
LG 1030 DATA ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞
BY 1040 DATA 2,21,193
BU 1050 DATA 18,3,-1,0
LP 1060 DATA ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞
DD 1070 DATA ⊞&&&&&⊞&&&⊞⊞&&&⊞&&&⊞
OG 1080 DATA ⊞&⊞&⊞&⊞&⊞&⊞⊞&⊞&⊞&⊞&⊞
GN 1090 DATA ⊞&⊞&⊞&⊞&⊞&⊞⊞&⊞&⊞&⊞&⊞
NK 1100 DATA ⊞&⊞&⊞&⊞&⊞&⊞⊞&⊞&⊞&⊞&⊞
JL 1110 DATA ⊞&⊞&&& &&&⊞⊞& &&&⊞&⊞
EJ 1120 DATA ⊞&⊞&⊞◙◙⊞&⊞⊞&⊞◙◙⊞&⊞&⊞
QL 1130 DATA ⊞&⊞&&& &⊞⊞&&& &&&⊞&⊞
NW 1140 DATA ⊞&⊞&⊞&⊞&⊞&⊞⊞&⊞&⊞&⊞&⊞
KY 1150 DATA ⊞&⊞&⊞&⊞&⊞&⊞⊞&⊞&⊞&⊞&⊞
OC 1160 DATA ⊞&⊞&⊞&⊞&⊞&⊞⊞&⊞&⊞&⊞&⊞
GJ 1170 DATA ⊞&⊞&⊞&⊞&⊞&⊞⊞&⊞&⊞&⊞&⊞
OI 1180 DATA ⊞&⊞&⊞&⊞&⊞&⊞⊞&⊞&⊞&⊞&⊞
VG 1190 DATA ⊞&&& &&&&&⊞⊞&&& &&&⊞
EF 1200 DATA ⊞&⊞◙◙⊞&⊞&⊞&⊞◙◙◙⊞&⊞
BE 1210 DATA ⊞&&& &&&⊞⊞&&&& &&&⊞
XD 1220 DATA ⊞&⊞&⊞&⊞&⊞⊞&⊞&⊞&⊞⊞⊞
UF 1230 DATA ⊞&⊞&⊞&⊞&⊞⊞&⊞&⊞&⊞⊞⊞
WE 1240 DATA ⊞&⊞&⊞&⊞&⊞⊞&⊞&⊞&   ⊞
EQ 1250 DATA ⊞&&&⊞&&&⊞⊞&&&⊞&&&⊞⊞⊞
LT 1260 DATA ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞
ON 1270 DATA 18,20,193
KQ 1280 DATA 1,3,0,1
MC 1290 DATA ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞
UF 1300 DATA ⊞&&&&&&&&⊞⊞&&&&&&&&⊞
UI 1310 DATA ⊞&&&⊞&&&&&&&&&&⊞&&&⊞
SW 1320 DATA ⊞&&&  &&&&&&&&&◙&&&⊞
VN 1330 DATA ⊞&⊞◙◙⊞&&&&&&&⊞ ◙ ⊞&⊞
TC 1340 DATA ⊞&&&  &&&&&&&&&◙&&&⊞
UU 1350 DATA ⊞&&&⊞&&&&&&&&&&⊞&&&⊞
UX 1360 DATA ⊞&&&&&&⊞&&&&⊞&&&&&&⊞
SE 1370 DATA ⊞⊞&&&&&&&&&&&&&&&&&⊞
IM 1380 DATA ⊞&&&&&&⊞⊞&&&⊞&&&&&&⊞
VG 1390 DATA ⊞&⊞&&&&&⊞⊞&&&&⊞&&&⊞
RF 1400 DATA ⊞&&&&&&&⊞&& ⊞⊞&&&&&&⊞
XG 1410 DATA ⊞&&&&&&⊞&&&&&&&&&&⊞⊞
UN 1420 DATA ⊞&&&&&&⊞&&&&&&&&&&⊞⊞
UQ 1430 DATA ⊞&&&⊞&&&&&&&&&&⊞&&&⊞
CL 1440 DATA ⊞&&&◙&&&&&&&&&&  &&&⊞
DH 1450 DATA ⊞&⊞ ◙ ⊞&&&&&&⊞◙◙◙⊞&⊞
CR 1460 DATA ⊞&&&◙&&&&&&&&&&  &&&⊞
VC 1470 DATA ⊞&&&⊞&&&&&&&&&&⊞&&&⊞
VF 1480 DATA ⊞&&&&&&&⊞⊞&&&&&&&&⊞
MG 1490 DATA ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞
MW 1500 DATA 10,13,285
YC 1510 DATA 1,21,0,-1
LN 1520 DATA ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞
JV 1530 DATA ⊞⊞⊞&&&&&&&&&&&&&&⊞⊞⊞
JY 1540 DATA ⊞⊞&&&&&&&&&&&&&&&⊞⊞⊞
CQ 1550 DATA ⊞&&&◙&&&&&&&&&&  &&&⊞
DM 1560 DATA ⊞&⊞ ◙ ⊞&&&&&&⊞◙◙◙⊞&⊞
CW 1570 DATA ⊞&&&◙&&&&&&&&&&  &&&⊞
KK 1580 DATA ⊞&&&⊞&&&&&&&&&&⊞&&&⊞
IE 1590 DATA ⊞&&&&&&  &&&&◙&&&&&&⊞
SS 1600 DATA ⊞&&&&⊞◙◙⊞⊞ ◙ ⊞&&&&&⊞
HI 1610 DATA ⊞&&&&&&  &&&&◙&&&&&&⊞
UR 1620 DATA ⊞&&&&&&⊞&&&&&⊞&&&&&&⊞
OD 1630 DATA ⊞&&&&&&◙&&&&  &&&&&&⊞
GA 1640 DATA ⊞&&&&⊞ ◙ ⊞⊞◙◙⊞&&&&&⊞
OJ 1650 DATA ⊞&&&&&&◙&&&&  &&&&&&⊞
KG 1660 DATA ⊞&&&⊞&&⊞&⊞&&&&⊞&&&⊞
TR 1670 DATA ⊞&&&  &&&&&&&&&◙&&&⊞
WI 1680 DATA ⊞&⊞◙◙⊞&&&&&&&⊞ ◙ ⊞&⊞
TX 1690 DATA ⊞&&&  &&&&&&&&&◙&&&⊞
JQ 1700 DATA ⊞⊞&&&&&&&&&&&&&&&&⊞⊞
JT 1710 DATA ⊞⊞⊞&&&&&&&&&&&&&&⊞⊞⊞
LR 1720 DATA ⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞
QG 1730 DATA 17,20,259
LI 1740 DATA 3,3,1,0
MW 1750 GRAPHICS 0:POKE 559,0:POKE 16,64:
   POKE 53774,64
ZV 1760 DIM MOVE$(56):MOVE$="hh◙hh◙hh◙h◙
   ◙h◙h◙■◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙◙
   ◙◙◙◙◙"
IB 1770 CHSET=144*256
AM 1780 ML=USR(ADR(MOVE$),57344,CHSET,102
   4)
OT 1790 RESTORE 1830
RW 1800 GOTO 1820
TV 1810 FOR I=0 TO 7:READ D:POKE CHSET+A*
   8+I,D:NEXT I
BS 1820 READ A:IF A<>-1 THEN GOTO 1810
SZ 1830 DATA 3,255,129,189,189,189,189,12
   9,255
JF 1840 DATA 4,60,102,195,153,153,195,102
   ,60
MT 1850 DATA 5,126,255,255,255,255,255,25
   5,126
SX 1860 DATA 6,24,62,96,60,6,124,24,0
DC 1870 DATA 7,60,126,219,255,102,60,36,1
   02
ZZ 1880 DATA 8,56,56,16,124,186,186,40,40
FV 1890 DATA -1
MF 1900 DIM SC$(20)
NR 1910 GRAPHICS 1+16:POKE 559,0:POKE 16,
   64:POKE 53774,64
WS 1920 POKE 708,8:POKE 709,196
TX 1930 POSITION 3,0:? #6;"antic magazine
   ":POSITION 6,1:? #6;"presents"
VN 1940 D=PEEK(560)+PEEK(561)*256+4:POKE
   D+6,7:POKE D+8,7
DW 1950 POSITION 2,5:? #6;"1040  TERMINAT
   OR":POSITION 2,7:? #6;"BY STEPHEN STOU
   T"
```

```
FA 1960 POSITION 2,20:? #6;"trigger to be
   gin"
ZR 1970 POKE 559,34
KA 1980 POKE 77,0:IF STRIG(0)<>0 THEN 198
   0
JE 1990 GRAPHICS 1+16:POKE 16,64:POKE 537
   74,64
IT 2000 POKE 711,40:POKE 710,116:POKE 708
   ,198:POKE 709,10
LD 2010 POKE 756,CHSET/256:RESTORE 600:SC
   REEN=1:LIVES=2
QN 2020 GOTO 540
```

LISTING 2

```
PI 10 REM 1040 TERMINATOR, LISTING 2
OY 20 REM BY STEPHEN STOUT
FJ 30 REM (c) 1985,1987 ANTIC PUBLISHING
VN 35 REM CREATES LINE 1760 FOR 1040 TERM
   INATOR
EV 40 REM (LINES 10-250 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   EEK(10592):POKE 10592,255
WO 70 FN$="D:LINES.LST":REM THIS IS THE N
   AME OF THE DISK FILE TO BE CREATED
RD 80 ? "■Disk or ■assette?";:POKE 764,25
   5
PY 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
   58) THEN 90
TH 100 IF PEEK(764)=18 THEN FN$="C:"
VB 110 POKE 764,255:GRAPHICS 0:? "      AN
   TIC'S GENERIC BASIC LOADER"
MY 120 ? ,"BY CHARLES JACKSON"
KB 130 POKE 10592,DPL:TRAP 200
PU 140 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LW 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BQ 160 AR$="":READ AR$
YC 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DM 180 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")        "
BK 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 160
MM 200 IF PEEK(195)=5 THEN ? :? :? "■TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CM 210 IF C<LN+1 THEN ? :? "■TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
UQ 220 IF FN$="C:" THEN ? :? " Prepare ca
   ssette, press [RETURN]"
AR 230 OPEN #1,8,0,FN$
PV 240 POKE 766,1:? #1;A$;:POKE 766,0
AL 250 CLOSE #1:GRAPHICS 0:? "■COMPLETED■
   "
KF 1000 DATA 84
BN 1010 DATA 0490550540480320680730770320
   77079086069036040053054041058077079086
   069036061034104104133002104
DH 1020 DATA 1330011041330041041330031041
   33006104133005160000240016177001145003
   230001208002230002230003208
OX 1030 DATA 0022300041980051650052012552
   08232198006165006201255208224096034155
```

easy joystick control online

TRIGGER THROTTLE

Article on page 12

LISTING 1

Don't type the TYPO II Codes!

```
UW 10 REM TRIGGER THROTTLE
IG 20 REM BY MATTHEW RATCLIFF
FJ 30 REM (c) 1985,1987 ANTIC PUBLISHING
EV 40 REM (LINES 10-250 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   EEK(10592):POKE 10592,255
YE 70 FN$="D:THROTTLE.EXE":REM THIS IS TH
   E NAME OF THE DISK FILE TO BE CREATED
RD 80 ? "■Disk or ■assette?";:POKE 764,25
   5
PY 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
   58) THEN 90
TH 100 IF PEEK(764)=18 THEN FN$="C:"
VB 110 POKE 764,255:GRAPHICS 0:? "      AN
   TIC'S GENERIC BASIC LOADER"
MY 120 ? ,"BY CHARLES JACKSON"
KB 130 POKE 10592,DPL:TRAP 200
PU 140 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LW 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BQ 160 AR$="":READ AR$
YC 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DM 180 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")        "
BK 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 160
MM 200 IF PEEK(195)=5 THEN ? :? :? "■TOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CM 210 IF C<LN+1 THEN ? :? "■TOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
UQ 220 IF FN$="C:" THEN ? :? " Prepare ca
   ssette, press [RETURN]"
AR 230 OPEN #1,8,0,FN$
PV 240 POKE 766,1:? #1;A$;:POKE 766,0
AL 250 CLOSE #1:GRAPHICS 0:? "■COMPLETED■
   "
IF 1000 DATA 317
JV 1010 DATA 2552550000642380641730360021
   41000001173037002141001001169004160001
   166020228020240252141036002
CA 1020 DATA 1400370021691901410020011620
   00142003001169011141066003173238064141
   072003142073003169066141068
WU 1030 DATA 0031690641410690030320862280
   96125127160193238244233227167243160212
   242233231231229242160212232
FF 1040 DATA 2422392442442362291601551270
   32032032066121032077097116116104101119
   032082097116099108105102102
FA 1050 DATA 0320320321551550801141011151
   15032074111121115116105099107032116114
   105103103101114032116111032
DI 1060 DATA 1120971171151011550401151011
   10100032094083041032115099114111108108
   105110103032116101120116032
BN 1070 DATA 1021141111090321091111001011
   09046155080114101115115032116114105103
   103101114032097103097105110
MP 1080 DATA 0321161110320991111101161051
   10117101155040115101110100032097032094
   081041046155155172000001061
LK 1090 DATA 001000000000000000080721730030
   01208022173016208208012238003001173002
   001141252002032046001104040
FL 1100 DATA 1080000011730162082402461690
   00141003001076028001201190208006169175
   141002001096169190141002001
FE 1110 DATA 096224002225002000064
```

LISTING 2

```
0100 ; TRIGGER THROTTLE, SOURCE CODE
0110 ; BY MATTHEW RATCLIFF
0120 ; (c)1987, ANTIC PUBLISHING
0130 JIFFY = $14
```

continued on next page

```
0140 CTL_S = 190        ; INTERNAL CODE
0150 CTL_Q = 175        ; INTERNAL CODE
0160 VVBLKD = $0224
0170 CH    =    $02FC
0180 ; Operating system equates:
0190 CIO =     $E456
0200 ICCOM = $0342
0210 ICBAL = $0344
0220 ICBAH = $0345
0230 ICBLL = $0348
0240 ICBLH = $0349
0250 ICAX1 = $034A
0260 ICAX2 = $034B
0270 TRIG0 = $D010      ;Joystick trig 0
0280 PUTBIN = $0B
0290 ;
0300      *=  $4000
0310 INIT
0320      LDA VVBLKD  ; Install
0330      STA VEXIT   ; VBI
0340      LDA VVBLKD+1 ; routine
0350      STA VEXIT+1
0360      LDA # <START
0370      LDY # >START
0380      LDX JIFFY
0390 HOLD
0400      CPX JIFFY     ; Sync so
0410      BEQ HOLD      ; VBI won't
0420 ;
0430      STA VVBLKD  ; crash the
0440      STY VVBLKD+1 ; installation
0450      LDA #CTL_S  ; procedure.
0460      STA THROTTLE
0470      LDX #0
0480      STX BUSYCTL ;Enable throt.
0490      LDA #PUTBIN ; Print title
0500      STA ICCOM   ; screen.
0510      LDA LEN
0520      STA ICBLL
0530      STX ICBLH
0540      LDA # <TITLE
0550      STA ICBAL
0560      LDA # >TITLE
0570      STA ICBAH
0580      JSR CIO
0590      RTS            ; Back to DOS
0600 ;
0610 TITLE
0620      .BYTE "  Antic's Trigger Thr
ottle ",155
0630      .BYTE "    By Matthew Ratclif
f   ",155,155
0640      .BYTE "Press Joystick trigger
 to pause",155
0650      .BYTE "(send ^S) scrolling te
xt from modem.",155
0660      .BYTE "Press trigger again to
 continue",155
0670      .BYTE "(send a ^Q).",155,155
0680 LEN
0690      .BYTE *-TITLE
0700 ;
0710 ; Trigger Throttle installed.
0720 ; Actual program is below.
0730 ;
0740      *=  $0100
0750 ; Place this code in the lower
0760 ; 62 bytes of the 256-byte
0770 ; system stack at $0100-$01FF.
0780 ; (Should be safe!)
0790 ;
0800 VEXIT
0810      .WORD 0       ;VBI exit vector
0820 THROTTLE
0830      .BYTE 0       ; Space or BS
0840 BUSYCTL
0850      .BYTE 0       ; Control flag
0860 START
0870      PHP           ; VBI starts
0880      PHA           ; Save all stats
0890      LDA BUSYCTL ; and regs.
0900      BNE TIMIT   ;ON
0910 ;
0920 TESTON
0930      LDA TRIG0    ; Busy on
0940 ;                   request?
0950      BNE EXIT     ; No. No change.
0960 ;
0970      INC BUSYCTL ;OFF, Turn it ON
0980      LDA THROTTLE ; Send next
0990 ;                 throttle state.
1000      STA CH
1010      JSR TOGGLE   ;Change throttle
1020 ;                   state.
1030 EXIT
1040      PLA           ; Restore stats
1050      PLP           ; and reg & exit
1060      JMP (VEXIT)
1070 ;
1080 TIMIT
1090      LDA TRIG0    ; Trig released?
1100      BEQ EXIT     ; No, time-out
1110 ;
1120      LDA #0       ; Yes, re-enable
1130      STA BUSYCTL
1140      JMP EXIT
1150 ;
1160 TOGGLE ;          If ^s, then
1170      CMP #CTL_S   ; next is ^q
1180      BNE TOGQ
1190 ;
1200      LDA #CTL_Q
1210      STA THROTTLE
1220      RTS
1230 ;
1240 TOGQ
1250      LDA #CTL_S
1260      STA THROTTLE
1270      RTS
1280 ;
1290      *=  $02E0    ; init addr.
1300      .WORD INIT   ; for LOAD
1310      .END
```

batting out baseball statistics with atari

BALLPARK FIGURES

Article on page 15

LISTING 1

Don't type the TYPO II Codes!

```
ZX 10 REM BALLPARK FIGURES
BZ 11 REM BY ED BROWN
QP 15 REM (c)1988, ANTIC PUBLISHING
KJ 20 GOTO 1060
BI 60 REM LINEUP CHECK
EE 65 ILF=0:FOR C=1 TO NSP:IF A=BO(C) AND
    C<>PTR THEN ILF=1
HO 70 NEXT C:IF ILF THEN ? "▣##";A;" alre
   ady in lineup                    ":FOR C=1
    TO 500:NEXT C
AH 75 RETURN
QD 80 REM SAVE
JJ 85 ? "Save to what filename";:INPUT FN
   AME$:GOSUB 395:OPEN #2,8,0,FNAME$:? #2
   ;NPIF:? #2;WIN:? #2;LOSS
ZK 90 FOR C=1 TO LEN(FILE$) STEP 74:? #2;
   FILE$(C,C+73):NEXT C:CLOSE #2:RETURN
```

```
FX 95 REM APPEND
HH 100 POSITION 2,22:? "You want to appen
   d (Y or N)?":CLOSE #1:OPEN #1,4,0,"K:"
   :GET #1,A:A$=CHR$(A)
WC 105 IF A$="N" THEN POSITION 1,19:? " "
   :GOTO 130
MM 110 IF A$<>"Y" THEN 100
FT 115 POSITION 2,22:? "Enter the # of th
   e new player";:INPUT A
UR 120 PTR2=PTR:PTR=0:GOSUB 65:PTR=PTR2:I
   F ILF THEN 115
OW 125 NSP=NSP+1:BO(NSP)=A
EC 130 POSITION 2,22:? BK$:RETURN
XO 135 REM SUBSTITUTE
ZD 140 POSITION 2,22:? "You want to subst
   itute (Y or N)?":CLOSE #1:OPEN #1,4,0,
   "K:":GET #1,A:A$=CHR$(A)
ZR 141 IF A$="N" THEN POSITION 2,22:? BK$
   :POSITION 1,18:? " ":RETURN
QI 142 IF A$<>"Y" THEN 140
EP 144 GOSUB 810:IF F6 THEN F7=1
HF 145 POSITION 2,22:? "Enter the # of th
   e substitute    ■■■";:INPUT A
AL 150 GOSUB 65:IF ILF THEN 145
PS 155 BO(PTR)=A:FIND$=STR$(A)
WD 160 IF LEN(FIND$)=1 THEN FIND$(2)="■"
OV 165 GOSUB 440:CUR$=FILE$(FPTR,FPTR+73)
   :GOSUB 495:GOSUB 520:RETURN
SM 170 REM ERROR TRAP
UK 175 ER=PEEK(195):POP :CLOSE #2:IF ER=1
   38 THEN ? "DEVICE NOT ON":GOTO 200
LO 180 IF ER=162 THEN ? "DISK FULL":GOTO
   200
WE 185 IF ER=170 THEN ? "FILE NOT FOUND":
   GOTO 200
UA 190 IF ER=165 THEN ? "INVALID FILENAME
   ":GOTO 200
KF 195 ? "***ERROR: CODE ";ER
SV 200 FOR C=1 TO 500:NEXT C:TRAP 175:GOT
   O 1080
NB 205 REM PRINT
NO 210 ? "Input team name";:INPUT CUR$:?
   "Input today's date";:INPUT FNAME$:LPR
   INT BK$;TITLE$
CO 211 LPRINT CHR$(15):REM CONDENSED PRIN
   T
GD 215 LPRINT :LPRINT "Stats for ";CUR$;"
   , ";FNAME$:LPRINT
VJ 220 LPRINT "Current Record: Won ";WIN;
   ", Lost ";LOSS:LPRINT :OPEN #2,8,0,"P:
   "
KB 225 ? #2;"PLAYER                   ";
QV 230 ? #2;"AB    AVG    WMO   SLUG%  OB%
   SF   SH   H    2B   3B   HR RBI   GW   BB   R
    SB SBA   SO GIDP"
DP 235 POKE 201,3:FPTR=1:FOR C=1 TO NPIF:
   CUR$=FILE$(FPTR,FPTR+73):GOSUB 495:GOS
   UB 335
BD 240 ? #2;"#";VAL(FILE$(FPTR,FPTR+1));"
   ";:IF VAL(FILE$(FPTR,FPTR+1))<10 THEN
   ? #2;" ";
DX 245 ? #2;FILE$(FPTR+2,FPTR+16);" ";
CD 250 A=OAB:GOSUB 275:A=AVG:GOSUB 300:A=
   AWMO:GOSUB 300:A=SP:GOSUB 300:A=OBP:GO
   SUB 300
DX 255 A=SAC:GOSUB 275:A=SH:GOSUB 275:A=S
   +D+T+H:GOSUB 275:A=D:GOSUB 275:A=T:GOS
   UB 275:A=H:GOSUB 275:A=RBI:GOSUB 275
CD 260 A=GW:GOSUB 275:A=BB:GOSUB 275:A=R:
   GOSUB 275:A=SB:GOSUB 275:A=SBA:GOSUB 2
   75:A=SO:GOSUB 275:A=HIDP:GOSUB 275
NI 265 ? #2;"":FPTR=FPTR+74:NEXT C:CLOSE
   #2:RETURN
UF 270 REM ?NUM
NM 275 IF A<10 THEN ? #2;"  ";A;"  ";:GOTO
   290
YY 280 IF A<100 THEN ? #2;" ";A;:GOTO 290
BZ 285 ? #2;A;
OA 290 ? #2;" ";:RETURN
OL 295 REM %
JX 300 IF A<0 THEN ? #2;" ----  ";:GOTO 32
   5
BI 305 IF A<10 THEN ? #2;" .00";A;" ";:GO
   TO 325
CP 310 IF A<100 THEN ? #2;" .0";A;" ";:GO
   TO 325
EY 315 IF A<1000 THEN ? #2;" .";A;" ";:GO
   TO 325
OR 320 FNAME$=STR$(A):? #2;FNAME$(1,1);".
   ";FNAME$(2,4);" ";
ZS 325 RETURN
HX 330 REM CALC
PL 335 AVG=-1:SP=-1:IF OAB>0 THEN AVG=INT
   (1000*(S+D+T+H)/OAB+0.5):SP=INT(1000*(
   S+2*D+3*T+4*H)/OAB+0.5)
PO 340 AWMO=-1:IF ABWMO>0 THEN AWMO=INT(1
   000*WMO/ABWMO+0.5)
FA 345 LP=0:CP=0:RP=0:IF TH>0 THEN LP=INT
   (100*LH/TH+0.5):CP=INT(100*CH/TH+0.5):
   RP=INT(100*RH/TH+0.5)
FJ 350 OBP=-1:IF AB>0 THEN OBP=INT(1000*(
   S+D+T+H+BB+ETC)/AB+0.5)
ZY 355 RETURN
YC 360 REM W/L RECORD
FU 365 ? "▶Did this team win this game (Y
   or N)?":CLOSE #1:OPEN #1,4,0,"K:":GET
   #1,A:A$=CHR$(A)
GB 370 IF A$="Y" THEN WIN=WIN+1:GOTO 385
TM 375 IF A$="N" THEN LOSS=LOSS+1:GOTO 38
   5
RO 380 GOTO 365
AE 385 RETURN
WW 390 REM FILENAME CHECK
BO 395 T$=FNAME$:IF T$(1,2)="D:" OR T$(1,
   3)="D1:" OR T$(1,3)="D2:" OR T$(1,3)="
   D3:" OR T$(1,3)="D4:" THEN 405
CQ 400 FNAME$(1,2)="D:":FNAME$(3)=T$
ZP 405 RETURN
RU 410 REM LOAD FILE
GR 415 ? "Load from what file";:INPUT FNA
   ME$:GOSUB 395:OPEN #2,4,0,FNAME$:INPUT
   #2;NPIF:INPUT #2;WIN:INPUT #2;LOSS
SB 420 L=1:TRAP 430
JT 425 INPUT #2;CUR$:FILE$(L)=CUR$:L=L+74
   :GOTO 425
EW 430 CLOSE #2:TRAP 175:RETURN
KT 435 REM FIND PLAYER
HZ 440 FND=0:FPTR=1:IF NPIF=0 THEN 460
ZV 445 FOR C=1 TO NPIF:IF FILE$(FPTR,FPTR
   +1)=FIND$ THEN FND=1:GOTO 455
GW 450 FPTR=FPTR+74
EL 455 NEXT C
XZ 460 IF  NOT FND THEN GOSUB 475
AB 465 RETURN
RE 470 REM NEW PLAYER
XD 475 NPIF=NPIF+1:POSITION 2,22:? "▶Play
   er #";BO(PTR);" is new. What is this
        player's name";:INPUT FNAME$
AS 480 FILE$(FPTR,FPTR+1)=FIND$:FILE$(FPT
   R+2,FPTR+16)="               ":FILE$(F
   PTR+2,FPTR+16)=FNAME$
TD 485 FOR C1=18 TO 72 STEP 3:FILE$(FPTR+
   C1-1,FPTR+C1+2)="0■■":NEXT C1:RETURN
DS 490 REM TRANSFER DN
KT 495 OAB=VAL(CUR$(18,20)):AB=VAL(CUR$(2
   1,23)):S=VAL(CUR$(24,26)):D=VAL(CUR$(2
   7,29)):T=VAL(CUR$(30,32))
ES 500 H=VAL(CUR$(33,35)):BB=VAL(CUR$(36,
   38)):ETC=VAL(CUR$(39,41)):SB=VAL(CUR$(
   42,44)):SBA=VAL(CUR$(45,47))
KU 505 SAC=VAL(CUR$(48,50)):RBI=VAL(CUR$(
   51,53)):SO=VAL(CUR$(54,56)):GW=VAL(CUR
   $(57,59)):HIDP=VAL(CUR$(60,62))
QM 510 SH=VAL(CUR$(63,65)):WMO=VAL(CUR$(6
   6,68)):R=VAL(CUR$(69,71)):ABWMO=VAL(CU
   R$(72,74)):RETURN
TF 515 REM PRINT MENU
DN 520 WM=0:HT=0:F1=0:F2=0:F3=0:F5=0:F6=0
   :? "▶INNING";INNING;" BATTER ";PTR;", #"
   ;VAL(CUR$(1,2));", ";CUR$(3,17)
MJ 525 ? "A)Single":? "B)Double":? "C)Tri
   ple":? "D)Home Run":? "E)Base on Balls
   ":? "F)Hit batter,Interference"
ND 530 ? "G)Reached on Error,CTRL G for F
   C":? "H)Out (CTRL H for Strikeout)":?
   "I)Sacrifice Out"
KY 535 ? "J)Hit into Double Play"
BQ 540 ? "K)RBI's":? "L)Attempted Steal":
   ? "M)Scored":? "N)Men on base":? "O)Ne
   xt Batter":? "P)Next Inning"
VL 545 ? "Q)Quit":? "R)Substitution":? "S
   )Append Lineup":? "T)Redo this frame":
   ? "QUERY LINE ":RETURN
HN 550 REM CHOICE
IC 555 POSITION 0,Y:? ">"
IO 560 IF PEEK(764)=255 THEN 560
UW 565 KEY=PEEK(764):CLOSE #1:OPEN #1,4,0
   ,"K:":GET #1,K
SG 570 IF KEY=14 THEN POSITION 0,Y:? " ":
   Y=Y-1:IF Y=0 THEN Y=20
YU 575 IF KEY=15 THEN POSITION 0,Y:? " ":
   Y=Y+1:IF Y=21 THEN Y=1
KR 580 IF KEY=14 OR KEY=15 THEN POSITION
   0,Y:? ">":GOTO 560
ZT 585 IF KEY=12 THEN K=64+Y:GOTO 605
EN 590 IF K=8 THEN K=72:IF  NOT F1 THEN S
   O=SO+1
YG 595 IF (K>64 AND K<85) OR K=7 THEN 605
```

continued on next page

```
PN 600 GOTO 560
LJ 605 K$=CHR$(K):POSITION 2,22:RETURN
LD 610 REM HIT
OA 615 HT=1:F1=1:IF K$="A" THEN S=S+1
AY 620 IF K$="B" THEN D=D+1
BV 625 IF K$="C" THEN T=T+1
JW 630 IF K$="D" AND  NOT F2 THEN F2=1:R=
   R+1:POSITION 1,13:? "*"
JT 635 IF K$="D" THEN H=H+1:IF  NOT F5 TH
   EN GOSUB 655
NF 640 IF WM THEN WMO=WMO+1
DV 645 OAB=OAB+1:AB=AB+1:RETURN
HO 650 REM RBI
MZ 655 GWF=1:F5=1:IF F7 THEN GWF=0
MX 660 POSITION 2,22:? "How many RBI's (1
   -4";:IF GWF THEN ? ",G";
XX 665 ? ")?   ":CLOSE #1:OPEN #1,4,0,"K:
   ":GET #1,A:A$=CHR$(A)
RC 670 IF (ASC(A$)<49 OR ASC(A$)>52) AND
   A$<>"G" THEN 660
PV 675 IF A$="G" AND  NOT F6 AND  NOT F7
   THEN GWF=0:GW=GW+1:F6=1:GOTO 660
XW 680 IF A$="G" AND  NOT GWF THEN POSITI
   ON 2,22:? "▣":GOTO 660
DU 685 A=VAL(A$):RBI=RBI+A:POSITION 2,22:
   ? BK$:POSITION 1,11:? "*"
EK 690 IF K$="D" AND A>1 AND  NOT F3 THEN
    K$="N":POSITION 1,14:? "*":GOTO 700
CJ 695 IF  NOT F3 AND K$<>"D" THEN K$="N"
   :POSITION 1,14:? "*"
ZD 700 RETURN
FF 705 REM SAC
WZ 710 POSITION 2,22:? "Sacrifice (H)it o
   r (F)ly?":CLOSE #1:OPEN #1,4,0,"K:":GE
   T #1,A:A$=CHR$(A)
TI 715 IF A$<>"H" AND A$<>"F" THEN 710
MO 720 IF A$="H" THEN SH=SH+1:GOTO 730
DF 725 SAC=SAC+1
EI 730 POSITION 2,22:? BK$:RETURN
DP 735 REM STEAL
CA 740 SBA=SBA+1
XM 745 POSITION 2,22:? "Successful steal
   (Y or N)?":CLOSE #1:OPEN #1,4,0,"K:":G
   ET #1,A:A$=CHR$(A)
OE 750 IF A$="Y" THEN SB=SB+1:GOTO 760
UT 755 IF A$<>"N" THEN 745
OY 760 POSITION 2,22:? BK$
AE 765 RETURN
IQ 770 REM FLAG CHECK
IV 775 F4=0:IF F1 AND ASC(K$)>64 AND ASC(
   K$)<75 THEN F4=1
JI 777 IF F1 AND K$="▣" THEN F4=1:? "▣":G
   OTO 800
DL 780 IF F2 AND K$="M" THEN F4=1
FC 785 IF F3 AND K$="N" THEN F4=1
DC 790 IF F5 AND K$="K" THEN F4=1
YO 795 IF F4 THEN POSITION 2,ASC(K$)-64:?
    "▣"
ZE 800 RETURN
QZ 805 REM TRANSFER UP
WS 810 CUR$(18,20)=STR$(OAB):CUR$(21,23)=
   STR$(AB):CUR$(24,26)=STR$(S):CUR$(27,2
   9)=STR$(D):CUR$(30,32)=STR$(T)
ZK 815 CUR$(33,35)=STR$(H):CUR$(36,38)=ST
   R$(BB):CUR$(39,41)=STR$(ETC):CUR$(42,4
   4)=STR$(SB):CUR$(45,47)=STR$(SBA)
VV 820 CUR$(48,50)=STR$(SAC):CUR$(51,53)=
   STR$(RBI):CUR$(54,56)=STR$(SO):CUR$(57
   ,59)=STR$(GW):CUR$(60,62)=STR$(HIDP)
ZE 825 CUR$(63,65)=STR$(SH):CUR$(66,68)=S
   TR$(WMO):CUR$(69,71)=STR$(R):CUR$(72,7
   4)=STR$(ABWMO)
VP 830 FILE$(FPTR,FPTR+73)=CUR$:RETURN
WW 835 REM ENTER A GAME
OD 840 POSITION 2,11
PA 845 ? "Is this the first game entered
   for     this team (Y or N)?":CLOSE #1:O
   PEN #1,4,0,"K:":GET #1,A:A$=CHR$(A)
OM 850 IF A$<>"Y" AND A$<>"N" THEN 840
RW 855 IF A$="Y" THEN GOSUB 1200:GOTO 880
PP 860 POSITION 2,13
VJ 865 ? "Is this team's file already loa
   ded in (Y or N)?":CLOSE #1:OPEN #1,4,0
   ,"K:":GET #1,A:A$=CHR$(A)
RG 870 IF A$<>"Y" AND A$<>"N" THEN 860
RO 875 IF A$="N" THEN GOSUB 415
RF 880 ? "▣":? :? :? "How many players in
    the starting    lineup";:INPUT NSP:
   FOR C=1 TO NSP:BO(C)=-1:NEXT C
MB 885 ? "Enter the starting batting orde
   r by    player numbers":FOR PTR=1 TO NS
   P
ZW 890 ? BK$:? "▣Batter #";PTR;:INPUT A
SY 895 ? "▣";:GOSUB 65:IF ILF THEN ? "▣";
   BK$:? "▣▣";BK$:? "▣▣":GOTO 890
GL 900 IF  NOT ILF THEN ? "▣";
SU 905 BO(PTR)=A:NEXT PTR:PTR=1:INNING=1
YS 910 FIND$=STR$(BO(PTR)):IF LEN(FIND$)=
   1 THEN FIND$(2)="▣"
BF 915 GOSUB 440:CUR$=FILE$(FPTR,FPTR+73)
   :GOSUB 495
PS 920 GOSUB 520:Y=1
YA 925 GOSUB 555
EH 930 GOSUB 775:IF F4 THEN 925
QM 935 IF KEY=12 THEN POSITION 1,Y:? "*"
YE 940 IF K>64 AND K<85 THEN POSITION 1,K
   -64:? "*"
GJ 942 IF K=7 THEN POSITION 1,7:? "*"
XV 945 IF K$="T" THEN GOSUB 495:Y=1:GOSUB
    520:POSITION 2,22:? "O.K., do it over
   ":F1=0:F2=0:F3=0
AT 950 IF K$="A" OR K$="B" OR K$="C" OR K
   $="D" THEN GOSUB 615
TF 955 IF K$="E" THEN BB=BB+1:AB=AB+1:F1=
   1
ST 960 IF K$="F" THEN ETC=ETC+1:AB=AB+1:F
   1=1
NM 965 IF K$="G" THEN AB=AB+1:OAB=OAB+1:F
   1=1
LA 967 IF K$="▣" THEN AB=AB+1:OAB=OAB+1:F
   1=1:IF  NOT F3 THEN K$="N":POSITION 1,
   14:? "*"
BF 970 IF K$="H" THEN OAB=OAB+1:AB=AB+1:F
   1=1
UH 975 IF K$="I" THEN GOSUB 710:AB=AB+1:F
   1=1:IF  NOT F3 THEN K$="N":POSITION 1,
   14:? "*"
RF 980 IF K$="J" THEN HIDP=HIDP+1:AB=AB+1
   :OAB=OAB+1:F1=1:IF  NOT F3 THEN K$="N"
   :POSITION 1,14:? "*"
ZN 985 IF K$="K" THEN GOSUB 655
UB 990 IF K$="L" THEN GOSUB 740
PX 995 IF K$="M" THEN R=R+1:F2=1
BK 1000 IF K$="R" THEN GOSUB 140
YJ 1005 IF K$="S" THEN GOSUB 100
YX 1010 IF K$="N" THEN ABWMO=ABWMO+1:WM=1
   :F3=1:IF HT THEN WMO=WMO+1
NS 1015 IF K$="O" OR K$="P" OR K$="Q" THE
   N GOSUB 810:PTR=PTR+1:IF PTR>NSP THEN
   PTR=1
ZN 1020 IF (K$="O" OR K$="P") AND F6 THEN
    F7=1
KG 1025 IF K$="P" THEN INNING=INNING+1:GO
   TO 910
OG 1030 IF K$="O" THEN 910
JE 1035 IF K$="Q" THEN 1045
TZ 1040 GOTO 925
YO 1045 GOSUB 365:IF FILE$<>"" THEN X=USR
   (ADR(SORT$),ADR(FILE$),74,INT(LEN(FILE
   $)/74),3,15,0)
AO 1050 RETURN
QW 1055 REM MAIN PROGRAM
FC 1060 DIM SORT$(182),A$(1),FILE$(3500),
   TITLE$(40),BO(15),FIND$(2),FNAME$(15),
   CUR$(75),K$(1),BK$(35),T$(15)
SZ 1065 POKE 710,132:POKE 712,6:POKE 709,
   10:POKE 752,1:TRAP 175:WIN=0:LOSS=0:F7
   =0
JA 1070 GOSUB 1150:BK$="
                       ":REM 35 BLANKS
RM 1072 SORT$(1,65)="Xh8iJYhLhKhWhUh
   Rh@hhhdYPV8QiQRiR01Q5R
   TLN"
DA 1073 SORT$(66,130)="PKMeU0PeWP
   9>Z>HHHX(1MQOPZP0.,0HJ
   PJSXDYPRF"
YM 1074 SORT$(131,182)="S)ESP&TPLFTPN
   0,UP/UP/U1M*10MOHDUPqpK"
CW 1075 TITLE$="********** BALLPARK FIGUR
   ES ********"
DY 1080 ? "▣";TITLE$:? :? "MAIN MENU (sel
   ect # of choice)":? :?
UZ 1085 ? "1) Print":? "2) Save File":? "
   3) Load file"
NQ 1086 ? "4) Enter a Game":? :CLOSE #1:O
   PEN #1,4,0,"K:":GET #1,A:A$=CHR$(A)
VC 1090 IF A$<>"1" AND A$<>"2" AND A$<>"3
   " AND A$<>"4" THEN 1080
PC 1095 A=VAL(A$)
CF 1100 ON A GOSUB 205,85,415,840:GOTO 10
   80
CD 1150 POKE 16,112:POKE 53774,112:RETURN
YT 1200 WIN=0:LOSS=0
KF 1210 FOR A=1 TO LEN(FILE$)-73 STEP 74
SY 1220 FILE$(A+17,A+73)="0▣0▣0▣0▣0▣0▣0▣
   0▣0▣0▣0▣0▣0▣0▣0▣0▣0▣0▣0▣0▣
   0▣0▣"
DA 1230 NEXT A:RETURN
```

antic's fourth annual 1040 syncalc template Article on page 33

'87 FEDERAL INCOME TAX

LISTING 1

```
A3 1
A4 2
A5 3
A6 4
A7 5
A10 6
A12 7
A13 8
A14 9
A15 10
A16 11
A17 12
A18 13
A19 14
A20 15
A21   16a
A22     b
A23 17
A24 18
A25 19
A26   20a
A27     b
A28 21
A29 22
A30 ----
A31 23
A32   24a
A33     b
A34 25
A35 26
A36 27
A37 28
A38 29
A39 ----
A40 30
A41 ====
A42 31
A43   32b
A44   33a
A45     b
A46 34
A47 35
A48 36
A49 37
A50 38
A51 39
A52 ----
A53 40
A54 41
A55 42
A56 43
A57 44
A58 45
A59 46
A60 47
A61 ----
A62 48
A63 49
A64 50
A65 51
A66 52
A67 53
A68 ----
A69 54
A70 55
A71 56
A72 57
A73 58
A74 59
A75 60
A76 61
A77 ----
A78 62
A79 63
A80 64
A81 65
A82 ====
A85 1a
A86 b
A87 c
A88 ____
A89 ____
A90 2
A91 3
A92 4
A93 ----
A94 5
A95 6
A96 7
A97 ----
A98 8
A99 ----
A100 9a
A101 b
A102 10
A103 11
A104 12a
A105 b
A106 13
A107 ----
A108 14a
A109 b
A110 15
A111 16
A112 17
A113 ----
A114 18
A115 ----
A116 19
A117 ----
A118 20
A119 21
A120 22
A121 23
A122 24
A123 ----
A124 25
A125 ----
A126 26
A127 ====
A129 1
A130 2
A136 3
A137 ----
A138 4
A144 5
A145 6
A146 7
A147 8
A148 9
A149 ====
B1 1987 Income Tax: Form 1040
B2 Filing Status
B3 Single
B4 MARRIED FILING JOINT
B5 MARRIED FILING SEPARATE RETURN
B6 HEAD OF HOUSEHOLD
B7 QUAL WIDOW/ER w/dpndnt children
B8 Enter filing status number here
B10 Enter total # of exemptions
B12 Wages, salaries, tips, etc.
B13 TXBL int incm (att Sched B if >$400)
B14 Tax-exempt interest income
B15 Dvdnd inc (att Sched B if >$400)
B16 Txbl rfnds of state&local incm taxes
B17 Alimony received.
B18 Bsns incm (loss)(attach Sched C)
B19 Capital gain (loss)(attach Sched D)
B20 Other gains (losses)
B21 Pensions, IRAs etc
B22 Taxable amount, if any
B23 Rents, royalties, etc.(att Sched E)
B24 Farm income (attach Sched F)
B25 Unemployment compensation
B26 Social security benefits
B27 Taxable amount, if any
B28 Other income
B29 Add amts in 7,8 & 10-21.TOTAL INCOME
B30 -------------------------------------
B31 Reimbursed employee business expense
B32 Your IRA deduction
B33 Spouse's IRA deduction
B34 Self-empld health insur deduction
B35 Keogh retirement
B36 Penalty on early withdrawl
B37 Alimony paid
B38 Add lines 23-28  TOTAL ADJUSTMENTS
B39 -------------------------------------
B40 Subt ln 29 from 22. ADJ GROSS INCOME
B41 =====================================
B42 Amt from line 30 (adj gross income)
B43 Add # of boxes checked & enter here
B44 ITEMIZED DEDUCTIONS
B45 STANDARD DEDUCTION
B46 Subtract 33a or 33b from 31.
B47 Mult $1900 by number of exemptions
B48 TXBL INCM. Subtract line 35 from 34
B49 Enter tax from table, rate sch, Sch D, etc.
B50 Addtl taxes from Form 4970/4972
B51 Add lines 37 and 38.
B52 -------------------------------------
B53 Credit for Child Care Expenses
B54 Credit for elderly/disabled
B55 Add lines 40 and 41
B56 Subtract line 42 from 39
B57 Foreign tax credit
B58 General business credit
B59 Add lines 44 and 44
B60 Subtract line 46 from 43
B61 -------------------------------------
B62 Self Employment Tax (Sched SE)
B63 Alt minimum tax
B64 Tax from recap of investment
B65 Social security tax on tips
B66 Tax on an IRA
B67 Add lines 47 through 52 -- Total Tax
B68 -------------------------------------
B69 Federal income tax witheld
B70 1987 estimated tax pmts
B71 Earned income credit
B72 Amt paid with Form 4868
B73 Excess social security tax
B74 Credit for Federal tax on gas
B75 Regulated investment company credit
```

continued on next page

```
B76 Add lines 54-60  Total Payments
B77 -----------------------------------
B78 If line 61>line 53 ent amt OVERPAID
B79 Amt of line 62 to be REFUNDED TO YOU
B80 Amt of line 62 to be applied twd '88
B81 If line 53>line 61 ent AMT YOU OWE
B82 ===================================
B84 SCHEDULE A
B85 Drugs, drs, dentists care expenses
B86 Transportation and lodging
B87 Other (hearing aids, dentures, etc)
B88 ___________________________________
B89 ___________________________________
B90 Add lines 1a through 1c
B91 Multiply 1040 line 31 by 7.5%
B92 Subtract line 3 from line 2
B93 -----------------------------------
B94 State and local income taxes
B95 Real estate taxes
B96 Oth txs (incl personal property tax)
B97 -----------------------------------
B98 Add lines 5-7  Enter total here
B99 -----------------------------------
B100 Home mortage int pd to Finan Inst
B101 Home mortage int pd to Individuals
B102 Deductible points
B103 Deductible investment interest
B104 Personal interest you paid
B105 Multiply 12a by 65%
B106 Add lines 9a through 11 and 12b
B107 -----------------------------------
B108 Cash contributions under $3,000.00
B109 Cash contributions over $3,000.00
B110 Other than cash
B111 Carryover from prior year
B112 Add amounts on lines 15a-16
B113 -----------------------------------
B114 Casualty or theft loss(es)
B115 -----------------------------------
B116 Moving expenses
B117 -----------------------------------
B118 Unreimbursed employee bsns expenses
B119 Other expenses____________________
B120 Add the amounts on lines 20 and 21
B121 Multiply 1040 line 31 by 2%
B122 Subtract line 23 from line 22
B123 -----------------------------------
B124 Misc deduc not subject to 2% AGI
B125 -----------------------------------
B126 Add lines 4,8,13,17-19,24  and 25
B127 ===================================
B128 SCHEDULE B
B129 Int incm from seller-financed mtges
B130 Other interest income:____________
B131 ___________________________________
B132 ___________________________________
B133 ___________________________________
B134 ___________________________________
B135 ___________________________________
B136 Add amounts on lines 1 and 2
B137 -----------------------------------
B138 Dividend income:__________________
B139 ___________________________________
B140 ___________________________________
B141 ___________________________________
B142 ___________________________________
B143 ___________________________________
B144 Add amounts on line 4
B145 Capital gain distributions
B146 Nontaxable distributions
B147 Add lines 6 and 7
B148 Subtract line 8 from line 5
B149 ===================================
C3 2540
C4 3760
C5 1880
C6 2540
C7 3760
C21 0
C26 0
C30 ---------
C31 0
C32 0
C33 0
C34 0
C35 0
C36 0
C37 0
C39 ---------
C41 =========
C43 0
C49 D, etc.
C52 ---------
C53 0
C54 0
C57 0
C58 0
C61 ---------
C68 ---------
C69 0
C70 0
C71 0
C72 0
C73 0
C74 0
C75 0
C77 ---------
C80 0
C82 =========
C85 0
C86 0
C89 0
C90 @SUM(C85:C89)
C91 0.075*D42
C93 ---------
C94 0
C95 0
C97 0
C99 ---------
C100 0
C101 0
C102 0
C103 0
C104 0
C105 C104*0.65
C107 ---------
C108 0
C109 0
C110 0
C111 0
C113 ---------
C115 ---------
C117 ---------
C118 0
C119 0
C120 @SUM(C118:C119)
C121 D42*0.02
C123 ---------
C125 ---------
C127 =========
C130 _________
C131 _________
C132 _________
C133 _________
C134 _________
C135 _________
C137 ---------
C138 _________
C139 _________
C140 _________
C141 _________
C142 _________
C143 _________
C145 0
C146 0
C149 =========
D8 1
D10 0
D12 0
D13 D136
D14 0
D15 D148
D16 0
D17 0
D18 0
D19 0
```

```
D20 0
D22 0
D23 0
D24 0
D25 0
D27 0
D28 0
D29 @SUM(D12:D28)
D30 ---------
D38 @SUM(C31:C37)
D39 ---------
D40 D29-D38
D41 =========
D42 D40
D44 @IF D45=0 THEN D126 ELSE 0
D45 @IF @LOOKUP(D8,A3:C5,2)<D126 THEN D126 ELSE 0
D46 D42-@MAX(D44:D45)
D47 1900*D10
D48 D46-D47
D49 0
D50 0
D51 D49+D50
D52 ---------
D55 C53+C54
D56 @IF (D51-D55>0 THEN D51-D55 ELSE 0)
D59 C57+C58
D60 @IF (D56-D59>0 THEN D56-D59 ELSE 0)
D61 ---------
D62 0
D63 0
D64 0
D65 0
D66 0
D67 @SUM(D60:D66)
D68 ---------
D76 @SUM(C69:C75)
D77 ---------
D78 @IF (D76>D67 THEN D76-D67 ELSE 0)
D79 D78-C80
D81 @IF (D67>D76 THEN D67-D76 ELSE 0)
D82 =========
D92 @IF (C90-C91>0 THEN C90-C91 ELSE 0)
D93 ---------
D98 @SUM(C94:C97)
D99 ---------
D106 @SUM(C100:C103)+C105
D107 ---------
D112 @SUM(C108:C111)
D113 ---------
D114 0
D115 ---------
D116 0
D117 ---------
D122 @IF (C120-C121>0 THEN C120-C121 ELSE 0)
D123 ---------
D124 0
D125 ---------
D126 @SUM(D124:D92)
D127 =========
D129 0
D130 0
D131 0
D132 0
D133 0
D134 0
D135 0
D136 @SUM(D129:D135)
D137 ---------
D138 0
D139 0
D140 0
D141 0
D142 0
D143 0
D144 @SUM(D138:D143)
D147 @SUM(C145:C146)
D148 D144-D147
D149 =========
```

part 1: multikey sort routine

SUPER SORTERS

Article on page 30

LISTING 1

Don't type the TYPO II Codes!

```
TF 10 REM MACHINE LANGUAGE SORTS, PART 1
WR 15 REM BY KEVIN PECK
QG 20 REM (c)1988, ANTIC PUBLISHING
MF 30 GOSUB 1000
TY 50 REM SET ASIDE ROOM FOR DATA
DB 70 DIM D$(460),F$(6),L$(7),P$(10)
LD 90 REM FILL DATA STRING WITH BLANKS
KZ 100 REM AND THEN READ DATA
WQ 120 D$=" ":D$(460)=" ":D$(2)=D$
JN 130 FOR I=1 TO 20:RECPNT=((I-1)*23)+1
DO 140 READ F$,L$,P$
AS 150 D$(RECPNT,RECPNT+LEN(L$))=L$
KW 160 D$(RECPNT+7,RECPNT+6+LEN(F$))=F$
CO 170 D$(RECPNT+13,RECPNT+12+LEN(P$))=P$
GH 180 NEXT I
JP 200 REM PRINT HEADING AND UNSORTED
EK 210 REM DATA TO SCREEN
QR 220 REM
UD 230 GOSUB 900
UQ 240 ? :? "Unsorted data....":GOSUB 600
QX 250 REM
HL 260 REM NOW SORT BY LAST, FIRST
PQ 270 REM AND PRINT NEW DATA
GE 290 A=USR(ADR(MKS$),ADR(D$),ADR(D$)+LE
   N(D$),7,0,6,7,23,0)
TY 300 GOSUB 900
TY 310 ? :? "Sorted by LAST, FIRST":GOSUB
   600
QS 320 REM
IA 330 REM NOW SORT BY POSITION,LAST
PL 340 REM AND PRINT NEW DATA
YG 360 A=USR(ADR(MKS$),ADR(D$),ADR(D$)+LE
   N(D$),10,13,7,0,23,0)
UM 370 GOSUB 900
PY 380 ? :? "Sorted by POSITION, LAST":GO
   SUB 600
RG 390 REM
NA 400 REM NOW SORT BY FIRST NAME ONLY
LZ 410 REM IN DESCENDING ORDER
TV 430 A=USR(ADR(MKS$),ADR(D$),ADR(D$)+LE
   N(D$),6,7,0,0,23,1)
UH 440 GOSUB 900
FL 450 ? :? "Sort by FIRST in Descending
   order":GOSUB 600
HW 460 GRAPHICS 0:CLR :END
TW 600 ? "Press SPACE BAR to Continue..
   .";
WO 610 POKE 764,255
JR 620 IF PEEK(764)<>33 THEN 620
XM 630 POKE 764,255:RETURN
MS 700 DATA MIKE,SMITH,PROGRAMMER
CW 710 DATA KEVIN,PECK,PROGRAMMER
OY 720 DATA BETTY,HUNTER,TRAINER
CY 730 DATA SCOTT,JONES,DRIVER
TQ 740 DATA BILL,SMITH,MANAGER
IM 750 DATA KIRK,PECK,TRAINER
TT 760 DATA HERMAN,SMITH,DRIVER
CT 770 DATA JILL,JOHNSON,DRIVER
```

continued on next page

```
YW 780 DATA FRED,JAMES,PROGRAMMER
JI 790 DATA BARNEY,HUNTER,DRIVER
EO 800 DATA SUSAN,HUNT,TRAINER
RY 810 DATA LOU,PECK,TRAINER
TM 820 DATA JOSH,SMITH,PROGRAMMER
JN 830 DATA MARY,JOHNSON,DRIVER
JR 840 DATA AMANDA,JAMES,PROGRAMMER
GE 850 DATA BOB,HUNT,DRIVER
PA 860 DATA JERRY,PECK,TRAINER
VQ 870 DATA MICKI,SMITH,PROGRAMMER
SC 880 DATA LEROY,JOHNSON,DRIVER
ZF 890 DATA JIM,HUNTER,TRAINER
CL 900 ? "K":POSITION 2,0:? " LAST      FI
   RST       POSITION "
JR 910 FOR I=1 TO 20:RECPNT=((I-1)*23)+1
SE 920 ? D$(RECPNT,RECPNT+6);"  ";D$(RECP
   NT+7,RECPNT+12);"      ";D$(RECPNT+13,RE
   CPNT+22)
MV 930 NEXT I:RETURN
UK 1000 DIM MKS$(192)
ZN 1010 MKS$="XhhNhMhWhUhhKhh0eKX
   hhPhhePehhLhhaWi8VeL0FN
   NUMeLTFUS0"
OE 1020 MKS$(81)="1MQTP50HDXPqPp.S1M
   QTP 0HDQPqpaP1MH1TMhTHDLPqp
   aPiTeLTUiUEW"
DO 1030 MKS$(161)="PTEUP&MeLMNiNE
   PMEPO"
AL 1040 RETURN
```

LISTING 2

```
TF 10 REM MACHINE LANGUAGE SORTS, PART 1
WI 20 REM BY KEVIN PECK
GD 30 REM (c) 1985,1988 ANTIC PUBLISHING
EI 35 REM (CREATES MKS$ IN LINES 1010-103
   0 FOR MULTISOR.DEM)
EV 40 REM (LINES 10-250 MAY BE USED WITH
   OTHER BASIC LOADERS IN THIS ISSUE.
IJ 50 REM CHANGE LINE 70 AS NECESSARY.)
PR 60 DIM FN$(20),TEMP$(20),AR$(93):DPL=P
   EEK(10592):POKE 10592,255
WO 70 FN$="D:LINES.LST":REM THIS IS THE N
   AME OF THE DISK FILE TO BE CREATED
RD 80 ? "KDisk or Cassette?";:POKE 764,25
   5
PY 90 IF  NOT (PEEK(764)=18 OR PEEK(764)=
   58) THEN 90
TH 100 IF PEEK(764)=18 THEN FN$="C:"
VB 110 POKE 764,255:GRAPHICS 0:? "     AN
   TIC'S GENERIC BASIC LOADER"
MY 120 ? ,"BY CHARLES JACKSON"
KB 130 POKE 10592,DPL:TRAP 200
PU 140 ? :? :? "Creating ";FN$:? "...plea
   se stand by."
LW 150 RESTORE :READ LN:LM=LN:DIM A$(LN):
   C=1
BQ 160 AR$="":READ AR$
YC 170 FOR X=1 TO LEN(AR$) STEP 3:POKE 75
   2,255
DM 180 LM=LM-1:POSITION 10,10:? "(Countdo
   wn...T-";INT(LM/10);")     "
BK 190 A$(C,C)=CHR$(VAL(AR$(X,X+2))):C=C+
   1:NEXT X:GOTO 160
MM 200 IF PEEK(195)=5 THEN ? :? :? "KTOO
   MANY DATA LINES!":? "CANNOT CREATE FIL
   E!":END
CM 210 IF C<LN+1 THEN ? :? "KTOO FEW DATA
    LINES!":? "CANNOT CREATE FILE!":END
UQ 220 IF FN$="C:" THEN ? :? " Prepare ca
   ssette, press [RETURN]"
AR 230 OPEN #1,8,0,FN$
PV 240 POKE 766,1:? #1;A$;:POKE 766,0
AL 250 CLOSE #1:GRAPHICS 0:? " COMPLETED 
   "
FR 1000 DATA 240
SS 1010 DATA 049048049048032077075083036
   0610342161041041332061041332051041332
   15104133214104104133203104104
HU 1020 DATA 133207024101203133216104104
   1332081041041332240241012081332091041
   04133204104104133225165215133
HQ 1030 DATA 001056165214229204133000176
   0021980010241652061332131652051012041
   33212144002230213164207034155
VP 1040 DATA 049048050048032077075083036
   0400560490410610341772052092122400041
   44053176028200196216208241165
YM 1050 DATA 208240046164224177205209212
   2400041440321760072001962092082412400
   27165225208023160000177205072
AT 1060 DATA 177212145205104145212200196
   2042082412400004165225208233024165212
   101204133212165213105000133213
GR 1070 DATA 197215034155049048051048032
   0770750830360400490540490410610342081
   72165212197214208166024165205
VX 1080 DATA 101204133205165206105000133
   2061970012081341652051970002081280960
   34155
```

ST RESOURCE

BASIC Concentration

Article on page 52

LISTING 1

```
' CONCENTRATION
' BY PAUL PRATT & STEPHEN EVERMAN
' (c) 1988, ANTIC PUBLISHING
'
Dim Title$(34),Obj$(33),Board(9,9),Pal(3)
Scr_mem=Xbios(3)
Title_start=27
Debug=0
Defmouse 5
@Mem_poke
@Board_screen
Players=99
Flag=1
Sayings=0
@Credit_screen
@Count_them
@Kolor
```

```
While Players<>0
  This_player=1
  @Main
  Sput Think$
  @Think
Wend
Cls
For X=0 To 3
  Setcolor X,Pal(X)
Next X
End
' ----------------------------------------------------------------
Procedure Main
  @New_game
  While Btn<>2
    Mouse Mx,My,Btn
    '    Print At(2,2);"                "
    '    Print At(2,2);Mx;" ";My
    If Btn=1 And Guess And My>177
      @Take_guess
    Endif
    If Chosen=2
      @Change_players
    Endif
    If Btn=1
      @Obj_put
    Endif
    While Btn<>0 And Btn<>2
      Btn=Mousek
    Wend
  Wend
Return
' ----------------------------------------------------------------
Procedure Obj_put
  If Mx>193 And Mx<447 And My>50 And My<169
    Put 10,180,Erase$                              !ERASE TEXT WINDOW
    Guess=False
    Check_pox=Int((Mx-160)/33)
    Check_poy=Int((My-34)/15)

    If Board(Check_pox,Check_poy)<>0 And (Check_pox<>Pox Or Check_poy<>Poy)
      Deffill 1,1,1
      Opox=Pox                  !keep old array offset of first object selected
      Opoy=Poy
      Oxobj_pos=Xobj_pos        !keep old screen position of first obj selected
      Oyobj_pos=Yobj_pos
      Pox=Check_pox             !get new array offset of second object selected
      Poy=Check_poy
      Xobj_pos=Pox*32+169       !get screen position of second object selected
      Yobj_pos=Poy*15+38
      Inc Chosen
      Center=Int((12-Len(Title$(Board(Pox,Poy))))/2)
      Print At(Title_start+Center,5);Title$(Board(Pox,Poy))
      Title_start=44
      Fill Xobj_pos+3,Yobj_pos+4
      Put Xobj_pos,Yobj_pos,Obj$(Board(Pox,Poy)),3
    Endif
  Endif
Return
```

continued on next page

```
 ----------------------------------------------------------------
Procedure Compare
  Hidem
  For X=0 To 80
    Sound 1,8,Random(12),6,1
  Next X
  Correct=False
  Deffill 3,1,1
  Prbox Xobj_pos-6,Yobj_pos-3,Xobj_pos+22,Yobj_pos+10
  Prbox Oxobj_pos-6,Oyobj_pos-3,Oxobj_pos+22,Oyobj_pos+10
  Print At(27,5);"           "
  Print At(43,5);"           "
  If Board(Pox,Poy)=Board(Opox,Opoy)
    Sound 1,12,1,7,20
    Correct=True
    Guess=True
    @Letters(Pox,Poy)
    @Letters(Opox,Opoy)
    @Award_prize
    Board(Pox,Poy)=0             !remove objects from array
    Board(Opox,Opoy)=0
    Deftext 2,1,0,9
    Text 66,192,"CLICK HERE NOW IF YOU WISH TO MAKE A GUESS."
  Else
    Sound 1,12,1,5,20
  Endif
  Sound 1,0,0,0
  Showm
Return
' -------------------------------------------------------------
Procedure Change_players
  Chosen=0
  @Compare
  Title_start=27
  Pox=99
  If Players=2 And Not Correct  !change players if 2 players and no match
    If This_player=1

      This_player=2
      Put 90,38,Obj$(0)       !switch player indication arrow
      Put 532,38,Obj$(33)
      Xprize1=Xprize
      Yprize1=Yprize
      Xprize=Xprize2
      Yprize=Yprize2
    Else
      This_player=1
      Put 90,38,Obj$(33)
      Put 532,38,Obj$(0)
      Xprize2=Xprize
      Yprize2=Yprize
      Xprize=Xprize1
      Yprize=Yprize1
    Endif
  Endif
  '
Return
' -------------------------------------------------------------
Procedure Take_guess
```

```
Guess=False
Put 10,180,Erase$                                   !ERASE TEXT WINDOW
Print At(3,24);
If (Bios(11,-1) And 16)=0
  Cap_lock=Bios(11,Bios(11,-1)+16)                           !SET CAP LOCK ON
Endif
Input My_guess$
If My_guess$=Answ$
  Hidem
  Put 10,180,Erase$
  Sget Win_screen$
  For X=0 To 15
    Sput Think$
    For S=0 To 7-X
      Sound 1,14,Random(12),X/2+1,1
    Next S
    Sput Win_screen$
    For S=0 To 7-X
      Sound 1,14,Random(12),X/2+1,1
    Next S
  Next X
  For X=1 To 8
    For Y=1 To 8
      @Letters(X,Y)
    Next Y
  Next X
  Sound 1,0,0,0
  Showm
  Deftext 2,0,0,9
  Text 52,192,"CONGRATULATIONS !  CLICK MOUSE 2 FOR NEW GAME"
  While Btn<>2
    Btn=Mousek
  Wend
Else
  Put 10,180,Erase$,3
    Deftext 2,0,0,9
    Text 52,192,"S O R R Y   T H A T  IS  I N C O R R E C T"
  Endif
Return
' -------------------------------------------------------------
Procedure Award_prize
  Put Xprize,Yprize,Obj$(Board(Pox,Poy)),3
  Add Xprize,32
  If Xprize>150 And This_player=1
    Xprize=43
    Add Yprize,15
  Endif
  If Xprize>600 And This_player=2
    Xprize=490
    Add Yprize,15
  Endif
Return
' ----------------------------------------------------
Procedure Letters(Xpox,Ypoy)
  Deftext 0,0,0,7
  Xch=172+Xpox*32
  Ych=45+Ypoy*15
  Ch$=Mid$(Quote$,(Ypoy-1)*8+Xpox,1)
```

continued on next page

```
  If Ch$=" "
    Deffill 2,1,1
    Prbox Xch-10,Ych-10,Xch+19,Ych+3
  Else
    Deffill 3,1,1
    Prbox Xch-10,Ych-10,Xch+19,Ych+3
    Text Xch,Ych,Ch$
  Endif
Return
' -----------------------------------------------------------
Procedure New_game
  Cls
  Sput Board$
  Put 90,38,Obj$(33),3
  For Y=0 To 3                  !each object number goes into board array twice
    For X=1 To 8
      Board(X,Y+1)=X+Y*8
      Board(X,Y+5)=X+Y*8
    Next X
  Next Y
  Xprize=43
  Yprize=53
  Xprize1=43
  Yprize1=53
  Xprize2=490
  Yprize2=53
  '
  If Debug=0 Then
    ' Remove these loops for testing--
    ' then the prizes always fall 4 rows apart in the same column.
    For X%=1 To 8                     ! shuffle prizes
      For Y%=1 To 8
        X1=Random(8)+1
        Y1=Random(8)+1
        Temp=Board(X,Y)
        Board(X,Y)=Board(X1,Y1)
        Board(X1,Y1)=Temp
      Next Y%
    Next X%
  Endif
  '
  Chosen=0
  Pox=99
  Title_start=27
  Deftext 1,1,0,9
  Text 72,192,"USE MOUSE BUTTON TWO FOR EXIT OR NEW GAME."
  @String_set_up
Return
' -------------------------------------------------------
Procedure Count_them
  Restore String_data
  While Flag=1
    Read Answ$
    On Error Gosub Eod
    Sayings=Sayings+Flag
  Wend
  On Error
Return
```

```
' ------------------------------------------
Procedure Eod
  Flag=0
  Resume Next
Return
' -------------------------------------------
Procedure String_set_up
  Restore String_data
  For X=1 To Random(Sayings)+1         !pick random string
    Read Answ$
  Next X
  If Debug=1 Then
    Answ$="NOW"     !  USE THIS FOR TESTING. THE ANSW IS ALWAYS "NOW"
  Endif
  Quote$=" "+Answ$+" "    !pad begining and end of string with spaces
  L=Len(Quote$)
  While L<>65                        !while string not expanded to 64 spaces
    Split=Random(L-1)+1              !pick random place to start in string
    While Mid$(Quote$,Split,1)<>" "   !if not space increment until it is
      Inc Split
    Wend
    Lq$=Left$(Quote$,Split)        !split the string in half and insert space
    Rq$=Right$(Quote$,L-Len(Lq$))
    Quote$=Lq$+" "+Rq$
    L=Len(Quote$)
  Wend
Return
' --------------------------------------------
Procedure Mem_poke
  For X=0 To 3
    Pal(X)=Xbios(7,X,-1) And &HFFF
    Setcolor X,258
  Next X
  Get 0,0,600,12,Erase$
  Get 0,0,15,7,Obj$(0)
  Obj=1
  Repeat
    Read A$
    Title$(Obj)=A$
    X=0
    Repeat
      Read Plane1,Plane2
      Dpoke Scr_mem+X*160,Plane1
      Dpoke Scr_mem+X*160+2,Plane2
      Inc X
    Until X=8
    Get 0,0,15,7,Obj$(Obj)
    Inc Obj
  Until Obj=34
Return
' ------------------------------------------
Procedure Kolor
  Setcolor 0,258
  Setcolor 1,1570
  Setcolor 2,87
  Setcolor 3,1911
Return
' -------------------------------------------
```

continued on next page

```
Procedure Board_screen
  Graphmode 2
  Cls
  Defline 1,5,0,0
  Deftext 2,1,0,26
  Text 74,24,500,"C O N C E N T R A T I O N"
  Deffill 2,1,1
  Color 3
  Rbox 189,46,454,172
  Fill 195,60
  Deffill 3,1,1
  For Uy=50 To 167 Step 15
    Dy=Uy+13
    For Ux=195 To 448 Step 32
      Dx=Ux+28
      Prbox Ux,Uy,Dx,Dy
    Next Ux
  Next Uy
  Deffill 1,1,1
  Rbox 189,28,318,42
  Rbox 327,28,454,42
  Rbox 3,179,623,196
  Color 2
  Defline 1,2,0,0
  For Uy=50 To 161 Step 15
    Rbox 28,Uy,172,Uy+13
    Rbox 470,Uy,614,Uy+13
    Fill 36,Uy+4
    Fill 474,Uy+4
  Next Uy
  Sget Board$
  Cls
Return
' -----------------------------------------
Procedure Credit_screen
  Cls
  Graphmode 2
  @Kolor
  X%=0
  Repeat
    Inc X%
    Put Random(613),Random(168)+28,Obj$(Random(31)+1),3
    Put Random(613),Random(168)+28,Obj$(Random(31)+1),3
    Put Random(613),Random(168)+28,Obj$(Random(31)+1),3
    Put Random(613),Random(168)+28,Obj$(Random(31)+1),3
    Sound 1,13,Random(12),X%/47+1
  Until X%>370
  Sound 1,0,0,0
  For X=0 To 3
    Setcolor X,258
  Next X
  Pbox 100,50,310,102
  Deffill 3,1,1
  For X=100 To 400 Step 144
    Pbox X,140,X+133,170
  Next X
  Deffill 2,1,1
  Pbox 270,70,520,120
```

```
  Deftext 1,0,0,32
  Text 328,104,"A N T I C"
  Deftext 0,0,0,4
  Text 124,60,"WRITTEN IN GFA BASIC BY"
  Text 150,74,"STEPHEN EVERMAN"
  Text 190,84,"&"
  Text 170,94,"PAUL PRATT"
  Text 380,114,"(c) 1988"
  Deftext 0,0,0,16
  Text 428,157,"T W O"
  Text 284,157,"O N E"
  Deftext 2,0,0,26
  Text 138,166,"EXIT"
  Deftext 0,0,0,6
  Text 284,166,"PLAYER"
  Text 426,166,"PLAYERS"
  Deftext 2,0,0,32
  Text 130,24,"C O N C E N T R A T I O N"
  @Kolor
  Print At(2,2);Chr$(7)
  Hidem
  Sget Think$
  Showm
  @Think
Return
' --------------------------------------------------
Procedure Think
  Thinking=True
  While Thinking
    Mouse Mx,My,Btn
    If Btn=1 And Mx>100 And Mx<522 And My>140 And My<171
      Thinking=False
      Players=(Mx-100) Div 142
    Endif
  Wend
  @Release
Return
' --------------------------------------------------
Procedure Release
  While Btn<>0
    Mouse Mx,My,Btn
  Wend
Return
' --------------------------------------------------
Game.data:
Data BUTTERFLY
Data 64479,64479,42404,23995,54314,10837,10261,54890
Data 57927,64575,48188,16963,47132,18019,33729,65535
Data CANDLE
Data 65535,65279,65535,65151,64575,65535,64575,65023
Data 64575,65535,64575,65023,34817,36849,49155,49267
Data FLOWER
Data 47999,30847,38773,28705,34527,61443,40955,33539
Data 31679,1083,31167,47647,64639,64959,65087,65279
Data ICECREAM
Data 65023,64031,63343,61583,60927,57863,61471,63463
Data 63519,63975,64575,65015,64575,65023,65151,65271
Data SODA
```

continued on next page

```
Data 64639,64639,63935,63935,61471,61471,63455,63455
Data 63455,62815,63455,63263,63455,62175,61471,61471
Data GOBLET
Data 49153,53247,58711,57347,57347,59391,64543,65023
Data 65407,65407,65407,65407,64543,64767,49153,51199
Data WINE GLASS
Data 49153,53247,59391,57347,62459,61447,64719,64575
Data 65407,65407,65407,65407,64543,64767,49153,51199
Data JOYSTICK
Data 63999,63999,65535,63999,65535,63999,65535,63999
Data 63998,63998,57468,57468,3,3,65535,32799
Data DISK
Data 8048,57359,8048,57359,8176,57359,16376,65535
Data 13816,62975,12120,61279,16376,65535,0,65535
Data CANDELABRA
Data 65535,52851,35939,65535,35939,65535,35939,65535
Data 35939,35939,1,1,64639,64639,61471,61471
Data HOUSE PLANT
Data 46067,65535,32876,63487,57351,64735,49155,64183
Data 32776,59103,6259,50563,59887,62991,63439,61455
Data CLOCK
Data 65535,65535,61455,61455,51171,49155,39033,32769
Data 40825,32769,36721,32769,49155,49155,960,960
Data LAMP
Data 62431,61471,53239,49159,32765,1,60527,64639
Data 60527,64639,64639,64639,64639,64639,61471,61471
Data EIGHTBALL
Data 57351,57351,34753,34753,67264,67264,67520,67520
Data 67264,67264,34753,34753,57351,57351,65535,65535
Data PEN
Data 65087,65535,65055,65055,65199,65391,65199,65391
Data 65215,65407,65215,65407,65151,65407,65407,65407
Data KEY
Data 64575,64767,63903,64447,57351,59391,61455,62463
Data 64575,65471,64639,65535,64639,65535,64639,65407
Data RING
Data 62895,61471,64223,63551,61455,65535,57799,61951
Data 58343,62463,58343,62463,61895,63999,63503,65535
Data T-SQUARE
Data 63519,65535,32769,65535,65151,65535,65151,65407
Data 65151,65535,65151,65407,65151,65535,65151,65407
Data PERFUME
Data 63519,64511,65151,65535,63967,63519,51195,49155
Data 39967,33249,39967,33249,61439,57347,62463,61455
Data BELL
Data 64575,64575,63903,63647,58359,57351,53243,49155
Data 50163,49155,40857,32769,34801,32769,65151,65151
Data THUNDER BIRD
Data 61503,61503,64575,64575,384,0,27702,384
Data 30750,13932,29742,29070,60855,57351,55707,49155
Data TABLE
Data 0,0,64575,64575,65151,65151,65151,65151
Data 64575,64575,64575,64575,63887,63887,58279,58279
Data BOOKS
Data 65311,59167,65311,59207,63519,59207,63519,59207
Data 63519,59207,38937,34625,6168,1792,65535,65535
Data FLAG
Data 65535,65535,1023,20480,1023,11263,1023,20480
```

```
Data 65534,32767,32767,32768,65535,65535,65535,65535
Data BAR-B--Q
Data 672,7512,32769,32769,57351,57351,63215,63215
Data 63215,63215,61455,61455,61175,61175,56827,56827
Data TELEVISION
Data 65535,52479,65535,62463,32769,32769,32961,36849
Data 34817,34289,33505,36273,32769,40965,32769,32769
Data BRIEF CASE
Data 57351,57351,59367,59367,0,8580,0,128
Data 0,0,0,0,0,0,65535,65535
Data RADIO
Data 32767,65535,65535,57343,65535,57343,0,0
Data 16316,16380,0,0,0,12684,0,0
Data DRINK
Data 64511,65535,65023,65535,63143,63399,63335,63463
Data 63335,63463,63415,63479,63415,61511,63503,63503
Data GUM MACHINE
Data 61455,61455,59239,59895,60279,59047,63183,61839
Data 64575,64575,64575,64575,61455,61839,49155,49155
Data CALCULATOR
Data 49159,49159,57335,57175,49159,49159,49159,49159
Data 51495,51495,49159,49159,49447,51495,49159,49159
Data APPLE
Data 61951,62463,56575,57603,65535,640,65535,0
Data 65535,0,49151,49153,61439,61443,63487,63495
Data ARROW
Data 448,0,448,0,448,0,3544,0
Data 2032,0,992,0,448,0,128,0
!
String_data:
Rem : When adding new string data do NOT to use commas in strings.
Data A STITCH IN TIME SAVES NINE
Data OLD SOLDIERS NEVER DIE THEY JUST FADE AWAY
Data THE SHORTEST DISTANCE BETWEEN TWO POINTS IS A STRAIGHT LINE
Data IF AT FIRST YOU DON'T SUCCEED TRY TRY AGAIN
Data YOU KNEW THE JOB WAS DANGEROUS WHEN YOU TOOK IT
Data TO ERR IS HUMAN TO FORGIVE IS DIVINE
Data YOU CAN'T KEEP A GOOD MAN DOWN
Data FISH AND VISITORS SMELL IN THREE DAYS
Data DON'T CRY OVER SPILT MILK
Data ANTIC THE ATARI RESOURCE
Data A BIRD IN THE HAND IS WORTH TWO IN THE BUSH
Data ONE SMALL STEP FOR MAN ONE GIANT LEAP FOR MANKIND
Data PEOPLE WHO LIVE IN GLASS HOUSES SHOULDN'T THROW STONES
Data WHERE THERE'S A WILL THERE'S A WAY
Data FRIENDS ROMANS COUNTRYMEN LEND ME YOUR EARS
Data YOU CAN'T MAKE A SILK PURSE OUT OF A SOW'S EAR
Data YOU CAN'T HAVE YOUR CAKE AND EAT IT TOO
Data MONEY IS THE ROOT OF ALL EVIL
Data TO BOLDLY GO WHERE NO MAN HAS GONE BEFORE
Data DON'T CUT OFF YOUR NOSE TO SPITE YOUR FACE
Data A ROLLING STONE GATHERS NO MOSS
Data A ROSE BY ANY OTHER NAME WOULD SMELL AS SWEET
Data MONEY IS THE ROOT OF ALL EVIL
Data GIVE ME LIBERTY OR GIVE ME DEATH
Data WHEN IN ROME DO AS THE ROMANS DO
Data LIVE FROM NEW YORK IT'S SATURDAY NIGHT
Data DON'T COUNT YOUR CHICKENS BEFORE THEY'RE HATCHED
```

Tech Tips

Antic pays $25 for every original and exclusive Tech Tip submission that we publish. Send your 8-bit or ST disk and printout to: Antic Tech Tips, 544 Second Street, San Francisco, CA 94107. Tech Tips welcomes very short programs that demonstrate the Atari's powers, simple hardware modifications, or useful macros for popular software.

DEBUG

A**ntic* Technical and Online Editor Charles Jackson uses the basic concept of this debugging routine whenever he has a program to edit. It is a quick, easy way to switch the [BREAK] key on and off. You can use this method with most programming languages to control any other debugging routine. For an example of how it works in GFA BASIC, examine the ***BASIC Concentration listing in this issue.

Obviously, this routine is more useful in larger programs. But in the following example, let's imagine that for some reason you choose to display a simple multiplication table over and over again:

```
1 DEBUG=1
100 IF NOT DEBUG THEN GOSUB 1000
110 FOR X=1 TO 10:FOR Y=1 TO 10
120 PRINT X*Y;" ";
130 NEXT Y:PRINT:NEXT X
140 PRINT:PRINT:GOTO 110
1000 POKE 16,112
1010 POKE 53774,112:RETURN
```

Lines 100 through 140 contain the main routine. Lines 1000 and 1010 disable the [BREAK] key. When DEBUG is equal to one, the program will skip these lines, permitting you to stop the program and fix any bugs.

Once your program is running properly, set DEBUG equal to zero to disable the [BREAK] key.

Ingenious programmers could also replace line 1 with the line:

```
1 DEBUG=(PEEK(53279)=5)
```

Here, the value of DEBUG depends on the value of PEEK(53279)—the memory location which keeps track of the console keys. When you press the [SELECT] key, PEEK(53279) will equal 5, and DEBUG will equal one. Otherwise, DEBUG=0.

The advantage of this technique is obvious. Just hold down the [SELECT] key and type RUN to enable all of your debugging routines. Otherwise, type RUN without pressing [SELECT] and your program will skip the debugging routines.

SNOWFALL

From England's Page 6 Magazine (January/February 1986) comes Fred Key's pretty Snowfall demo, which demonstrates the effects of a crosswind on falling snow.

Don't type the TYPO II Codes!

```
CS 1 REM ##################################
EY 2 REM # SNOWFALL 2  - by Fred Key      #
SB 3 REM # PAGE 6 MAGAZINE - ENGLAND      #
CW 5 REM ##################################
XI 10 DIM FL(14,1):GRAPHICS 5+16
NC 15 SETCOLOR 4,8,4:SETCOLOR 0,0,14:SETCOLOR 1,12,8:SETCOLOR 2,3,8
ME 20 GOSUB 1000
KG 30 GOSUB 2000:FLC=0:K=1
AS 35 COLOR 1:FOR I=0 TO 14:FL(I,1)=FL(I,1)-47:NEXT I
XZ 40 FOR I=0 TO 14:IF FL(I,1)<0 THEN FL(I,1)=FL(I,1)+1:GOTO 100
YQ 50 TRAP 80:LOCATE FL(I,0)+1,FL(I,1)+1,Z
FB 60 IF Z=0 THEN 80
TD 70 GOSUB 300:FL(I,1)=0:IF PEEK(764)=45 THEN FL(I,1)=-47:FLC=FLC+1:GOTO 100
KT 75 Y=INT(RND(0)*46):X=INT(RND(0)*76):Z=INT(RND(0)*3+1):ON Z GOTO 76,77,76
TL 76 FL(I,0)=X:FL(I,1)=0:GOTO 90
JT 77 FL(I,0)=0:FL(I,1)=Y:GOTO 90
PW 80 COLOR 0:PLOT FL(I,0),FL(I,1):FL(I,0)=FL(I,0)+1:FL(I,1)=FL(I,1)+1
OS 90 TRAP 75:COLOR 1:PLOT FL(I,0),FL(I,1)
TJ 100 NEXT I:POKE 77,0:IF FLC=15 THEN 120
QI 110 GOTO 40
CB 120 POKE 764,255:GOSUB 2000
SY 140 FOR I=0 TO 14
JW 145 IF FL(I,1)=47 THEN GOSUB 500
HN 150 TRAP 190:LOCATE FL(I,0),FL(I,1),Z:IF Z=0 THEN 190
WK 160 IF Z<>1 THEN 180
WA 170 COLOR 0:PLOT FL(I,0),FL(I,1)
SW 175 GOSUB 400
GU 180 FL(I,1)=0:FL(I,0)=INT(RND(0)*80):GOTO 200
BU 190 FL(I,1)=FL(I,1)+1
LO 200 NEXT I:POKE 77,0:IF PEEK(764)<>62 THEN 140
WD 210 POKE 764,255:GOTO 30
XF 300 TRAP 350:LOCATE FL(I,0),FL(I,1)+1,X:LOCATE FL(I,0)+2,FL(I,1)+1,Y
BM 310 IF X<>0 AND Y<>0 THEN RETURN
FJ 320 J=1:IF X=0 THEN J=-1
VU 330 COLOR 0:PLOT FL(I,0),FL(I,1)
TU 340 COLOR 1:FL(I,0)=FL(I,0)+1+J:FL(I,1)=FL(I,1)+1:POP :GOTO 90
ZJ 350 RETURN
AL 400 TRAP 450:LOCATE FL(I,0)-1,FL(I,1)-1,X:LOCATE FL(I,0)+1,FL(I,1)-1,Y
CJ 410 IF X=0 AND Y=0 THEN RETURN
LL 430 IF X=1 THEN J=-1:GOTO 440
IF 435 IF Y=1 THEN J=1:GOTO 440
ZY 436 RETURN
FB 440 FL(I,0)=FL(I,0)+J:FL(I,1)=FL(I,1)-10:POP :GOTO 200
ZK 450 RETURN
KU 500 K=-K:TRAP 550
QU 510 LOCATE FL(I,0)+K,46,X
BO 520 IF X=0 THEN FL(I,0)=FL(I,0)+K:GOTO 510
IW 530 IF X<>1 THEN POP :GOTO 180
BA 540 FL(I,0)=FL(I,0)+K:FL(I,1)=37:RETURN
OA 550 POP :GOTO 180
UH 1000 COLOR 1:PLOT 0,47:DRAWTO 79,47
RH 1010 COLOR 2:PLOT 10,25:DRAWTO 20,25
MO 1020 PLOT 15,26:DRAWTO 15,47
BK 1030 COLOR 3:J=70:FOR I=10 TO 20:PLOT J,I:DRAWTO 79,I:J=J-1.5:NEXT I
IO 1040 FOR I=19 TO 47:PLOT 60,I:DRAWTO 79,I:NEXT I
AB 1100 RETURN
FA 2000 FOR I=0 TO 14
AO 2010 FL(I,0)=INT(RND(0)*80):FL(I,1)=INT(RND(0)*47)
DB 2020 LOCATE FL(I,0),FL(I,1),X:IF X<>0 THEN 2010
GH 2030 NEXT I:RETURN
```

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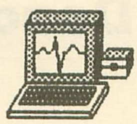
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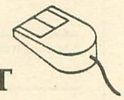
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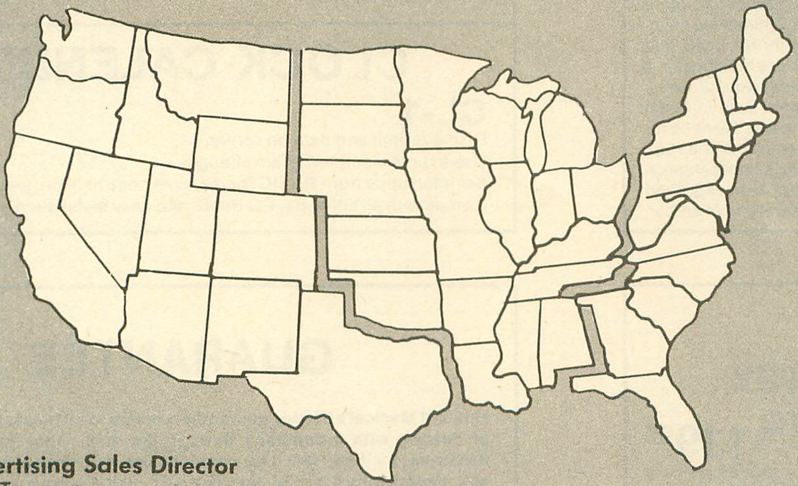
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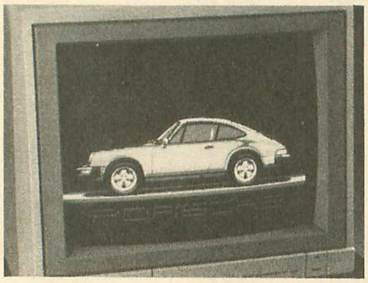
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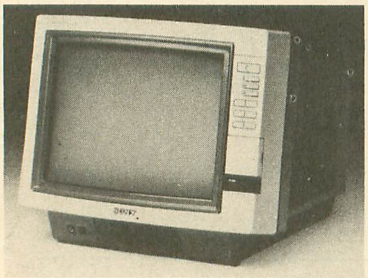
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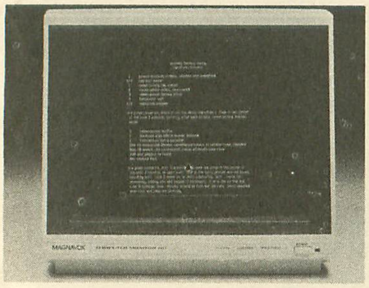
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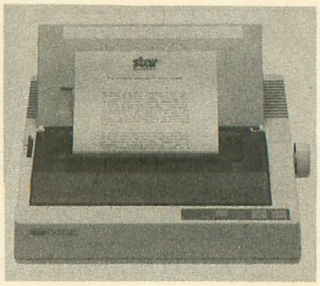
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color
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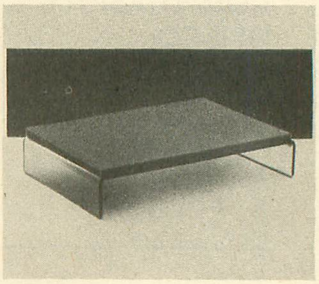
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Amber
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(7 ship)
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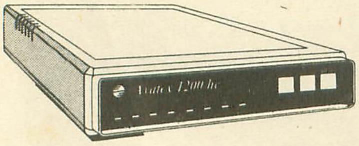
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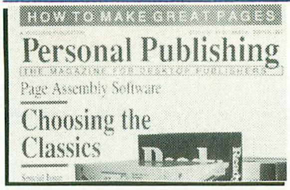
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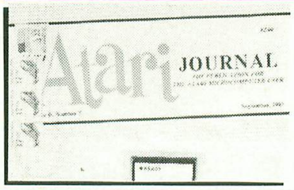
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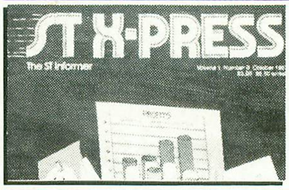
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